BUSINESS WEEK

NOV 2 4 1944

YEAR AGO

WEEK AGO

START OF WAR 1939

In This Issue:

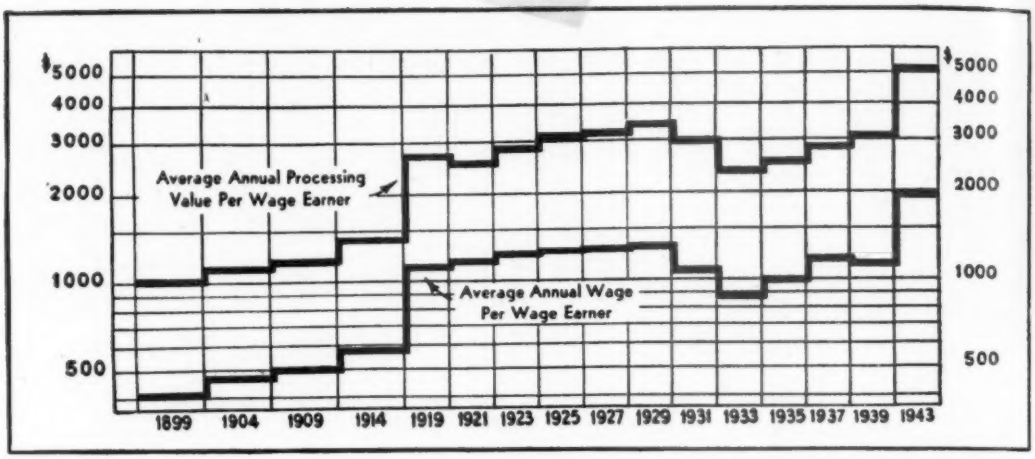
What's Coming in Chemicals

A Report To Executives

A BUSINESS WEEK SERVICE

TWENTY CENTS PUBLISHED BY THE McGRAW-HILL

Cop. 2



Findings from "The Share of Production Pay Plan", published by The Eddy-Rucker-Nickels Company, Management Counsel, Cambridge, Massachusetts

Why America's war-built machines can assure a prosperous peace

A WORKMAN can only be paid out of what he produces. The chart above shows that he is paid *in proportion* to what he produces. Modern machines help him produce more.

Therefore if government will let industry accumulate enough money to buy the war-built machines we have, and if labor will use those machines efficiently to produce more, lab cannot help but earn more, and be mo secure. History, common sense and arit metic all prove it.

Instead of a depression threat, the m chines America has and can produce are t best *and only* opportunity to a prospero peace . . . *if* industry can b them, *if* labor uses them w

WARNER & SWASEY
Turret Lathes
Cleveland

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS . . . WITH A WARNER & SWAS

He matches and always wins

A typical example of B. F. Goodrich development in rubber

MANY trucks have dual tires on the rear — two sets of two tires each — so they can carry heavier loads. Whenever duals are used, however, tire problems increase. The two tires must be spaced just so — not too close, not too far apart. Inflation must be watched carefully. Wheels must not toe in or toe out and the tires in a dual set should have *exactly* the same diameters so that each will carry its exact share of the load. If one tire is worn down, it needs another worn tire for its running mate.

Failure to observe all the necessary rules can easily cut the mileage of dual tires in half. In the picture above a B. F. Goodrich tire specialist of the Conservation Department is matching dual tires with a special measuring stick developed for that purpose. He never mounts a set of duals unless they match perfectly. That's why we say "he matches and always wins."

Under a scientific B. F. Goodrich program, now being used by truck fleets with from 10 to 3200 vehicles, factory-trained tire men take over the complete supervision of tire maintenance. They have saved hundreds, possibly thousands, of tons of rubber and hundreds of fleet owners have found that this conservation plan saves money for them.

Only a few B. F. Goodrich tire specialists are now available to take over additional fleets. If your company operates trucks, and if you would like to know how this service can be applied to increase *your* mileage, write the *Tire Conservation Dept., The B. F. Goodrich Co., Akron, O.*

B.F. Goodrich

Truck & Bus Tires

Some of our immigrants years ago were sadly disappointed because our streets were not paved with gold.

Other immigrants rolled up their sleeves, went to work and *found* gold—not in the pavements but all over this great country.

Freedom of opportunity—Free Enterprise—has helped Americans reach and release our national resources. We *must* keep Free Enterprise.

SKF INDUSTRIES, INC., PHILA., PA.

5491

BUSINESS WEE

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BUSINESS WEEK • NOVEMBER 25 • NUMBER
(with which is combined The Annalist and
Magazine of Business). Published weekly by McGr
Hill Publishing Company, Inc., James H. McGr
Founder and Honorary Chairman. PUBLICATI
OFFICE 99-129 NORTH BROADWAY, ALBANY
N. Y. EDITORIAL AND EXECUTIVE OFFICES, 33
42ND ST., NEW YORK 18, N. Y. James H. McGraw,
President; Howard Ehrlich, Executive Vice-Presi
for Business Operations; John Abbink, Executive V
President for Editorial Operations; Curtis W. McGr
Treasurer; J. A. Gerardi, Secretary. Allow ten d
for change of address. About subscriptions addr
J. E. Blackburn, Jr., Director of Circulation, Busi
Week, 330 West 42nd St., New York 18, N. Y.

Subscription rates — United States, Mexico, C
Central and South American countries $5.00 a ye
Canada $6.00 for a year. Entered as second cl
matter December 4, 1936 at the Post Office at A
bany, N. Y., under the Act of March 3, 1879. Re
postage guaranteed. Printed in U. S. A. Copyri
1944 by the McGraw-Hill Publishing Company, I

WASHINGTON BULLETIN

ge-Price Line to Hold

The Administration is determined to d the wage-price line until V-E Day. th pre-election inhibitions out of r system, stabilization officials have no time making this clear.

On wages, the policy is to stick to the ered but still serviceable Little Steel mula, which limits wage boosts to % above the January, 1941, level. On es, it is to hold out stubbornly inst any further rise in the cost of g, which has been creeping up the past year.

uring Pay Envelopes

Wage control strategy unfolded this k. It boils down to two points: (1) ure labor that its income will be pro- ted after Germany goes under and big cutbacks start; (2) stave off any ease in basic wage rates that would ch Little Steel until it is quite clear victory in Europe is imminent.

The report of the President's cost-of- ng committee (page 116), headed by illiam H. Davis, chairman of the Na- al War Labor Board, knocked the tom out of labor's brightest hope for her wages now. The committee (la- members dissenting) found that the of living has risen no more than % since January, 1941, not 45% labor leaders have argued.

In a companion statement, Economic bilization Director Fred M. Vinson ed a little sugar with the gall that is served up to the unions. He ed for a new effort to hold the price e, and promised a high wage policy er V-E Day to insure mass spending ver in the postwar period. This lays basis for across-the-board wage osts as soon as Germany goes under.

blic Members Hold Cards

The four public members of NWLB ho in effect make the board's deci- ns because they hold the balance of wer—now are in a position to make tle Steel stick no matter how much or protests. Three of them—Davis, nk P. Graham, and George W. Tay- —tendered resignations (BW—Nov. 44,p102) which Roosevelt refused to ept. Coming just before the big con- tions of the A.F.L. and C.I.O., this k the wind out of labor's sails.

A.F.L. representatives on NWLB e back in the fold this week after lking out when the board turned wn their motion to review the whole wage stabilization program and recommend a general increase in wages. The reason for their return: The board went ahead with consideration of the C.I.O. steelworkers' demand for a 17¢ hourly increase and other adjustments, and A.F.L. representatives couldn't afford to let the decision go through without being on hand to look out for their interests.

When they returned to the board they, like the C.I.O. members, were resigned to the realization that the ruling in the steelworkers' case would fit the familiar hold-the-line pattern. They were sure that instead of giving a 17¢ increase, which would smash Little Steel to bits, the board would deal only with the secondary demands of the steel union—vacation pay, higher differentials for night work, correction of inequities —and that the adjustments would probably add up to only a 10¢ hourly rise.

New Answer—Statistically

Labor leaders won't take rejection of their wage demands placidly. Failing to get official sanction for their argument that living costs have gone up more than the index shows, they now are training their guns on the fact that Davis admits to an increase of 30% since January, 1941, while Little Steel allows wages only a 15% rise for the same period. As an answer, the public members of NWLB are warming up a new set of figures.

A recent study by the Bureau of Labor Statistics shows that while the cost of living was climbing 29% or 30%, going urban wage rates—the best available measure of the "price of labor"—have risen 28%, thanks to raises in the form of promotions, incentive payments, merit increases, and the like. If this 28% figure is deflated by elimination of the extras, BLS still comes out with only 16% for the general basic increase—roughly the limit set by Little Steel.

These figures give NWLB some useful ammunition. They suggest that there is just about as much stretch in wage controls as in price controls. Both wages and prices were ordered frozen after each had risen about 15% over the base date, but exceptions to the freeze have raised both averages more than 15%. According to the BLS figures, this extra rise has been about as much for wages as for prices. Hence, the board can argue, the increase in cost of living has been offset almost exactly by a gain in wages.

A Major Loophole

In reaffirming the hold-the-line policy until V-E Day, NWLB is leaving one major loophole. Davis commented in his cost-of-living report that workers in that lowest income bracket have suffered more than a 30% rise in living expenses because their budgets include a heavier proportion of the items that have shown the greatest price rise—principally food and clothing.

Some adjustment for this class of wage earners is in the cards before V-E Day. Middle-bracket workers may get a tapered benefit designed to preserve historic wage differentials.

Pepper Advocates 65¢

Despite its sympathy for lower-bracket wage earners, NWLB is lukewarm toward the current proposal for boosting the minimum wage as high as 65¢. The board does not object to the resolution sponsored by Sen. Claude Pepper, which would establish 65¢ as a guide in determining what wages are substandard. This would be permissive, not mandatory, and would make it easy for NWLB to take care of low-income groups in its own way. Davis has told a Senate subcommittee, however, that 65¢ as a flat minimum might prove too high for some industries.

Unions Want to Get Busy

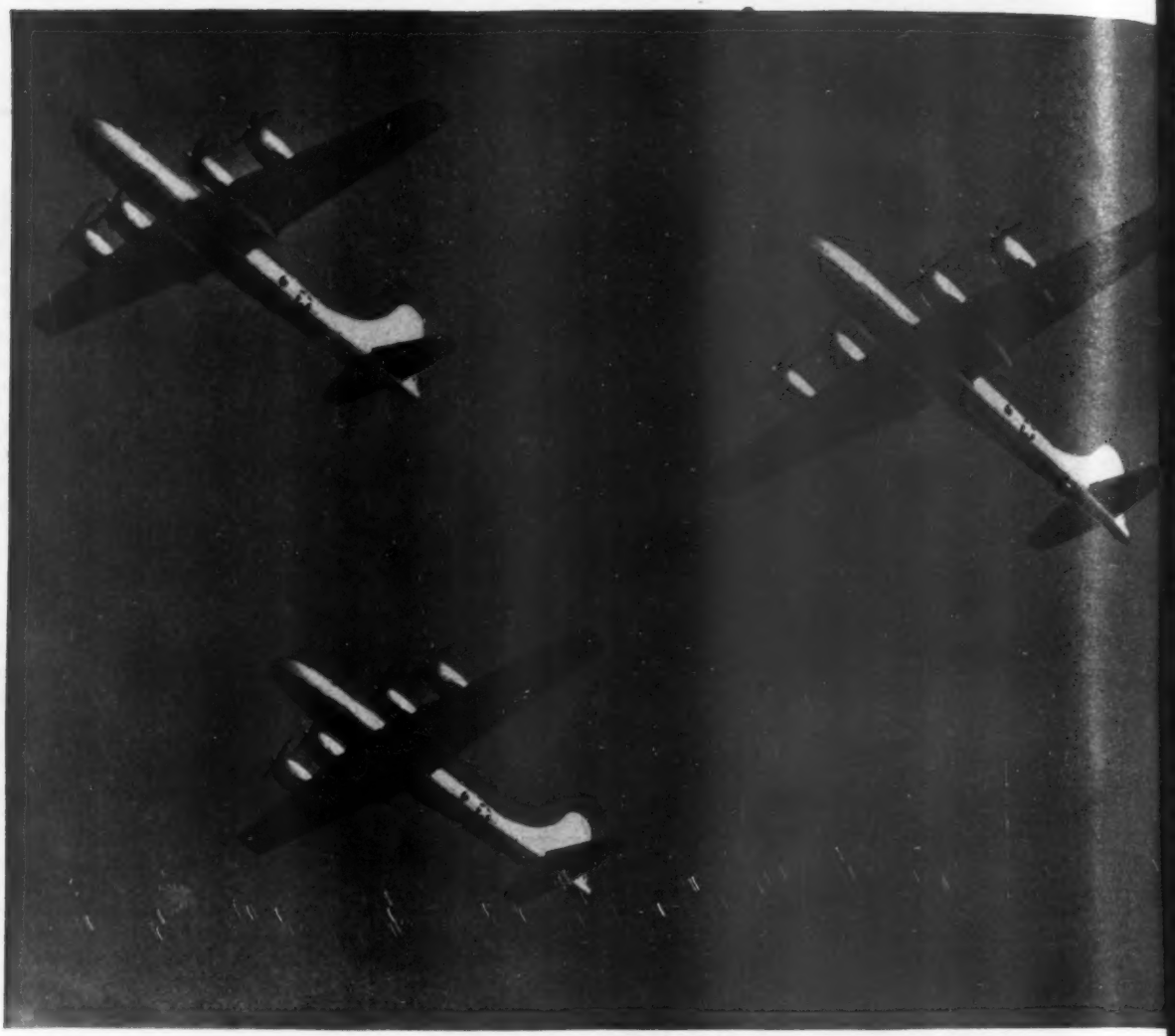
At least one detail of the official policy on wage increases after V-E Day still has to be worked out: Shall employers and unions be permitted to bargain now for wage adjustments to take effect when the government gives the signal? Unions are anxious to get everything buttoned up in advance while there is no unemployment and labor's bargaining power is at its peak.

•

Vinson Is Digging In

Although there is no longer any immediate prospect that he will step into the shoes of War Mobilization Director James F. Byrnes, Fred M. Vinson apparently is prepared to buckle down and make a name for himself as Economic Stabilization Director. In his statement on the cost-of-living report, Vinson announced that "wherever our present price and production controls are too lax—as is the case in textiles and clothing—we must tighten them."

As Vinson's statement reached the



Only the beginning

All the Free World has thrilled to the news of Boeing B-29 raids on Japan. They were just the beginning. More Superfortresses are on the way . . . many, many more!

Back of the B-29 is one of the most gigantic manufacturing programs ever placed behind any weapon of war. And Boeing brings to the task the same manufacturing philosophy that shattered all airplane production records in the output of Boeing Flying Fortresses.

The Boeing Superfortress is being built largely by people who never worked on production lines before; drug clerks and housewives, farmers and truck drivers, school girls and grandfathers.

But such things don't "just happen." The efficient use of previously unskilled people is a by-product of good production planning and organizing.

At Boeing this planning starts with the original conception of a new design and encompasses all functions of its production. It is a *basic consideration* which results in simplifying the manufacture of a complex product and, as in the case of the Superfortress, permits it to be produced in quantity by previously unskilled people.

Plans developed by Boeing now gui
the entire over-all production program
dozens of other co-operating plants i
cluding those of Bell and Martin, whi
are also turning out completed Boei
B-29's. This program was pattern
after the co-operative plan under whi
Douglas and Lockheed have built a
will continue to build Boeing B-17's.

*Once the war is over, Boeing meth
of research, design, engineering a
manufacture will be turned again
peacetime products. And they will
sure that any product "Built by Boei
is bound to be good.*

DESIGNERS OF THE FLYING FORTRESS • THE NEW B-29 SUPERFORTRESS • THE STRATOLINER • PAN AMERICAN CLIPPERS **BOEING**

ss, OPA was putting the final ches on its revision of Maximum ce Regulation 127, which covers cot- and rayon finished piece goods. PA now thinks it has a formula ich will roll back prices of rayon e goods. On cotton piece goods, PA will do well to hold the line where s because of price increases recently nted at the mill level under the nkhead amendment to the stabiliza- act.

OPA is still hopeful that it can force tributors to absorb Bankhead boosts other cotton goods, keeping them of the cost-of-living index. More nt WPB-OPA programs to boost pro- ction of low-priced clothing also are the offing, and OPA is looking at rment manufacturers' price regula- ns to see where they can be tight- ed.

•

ead to Probe War Output

The Senate Mead committee (for- rly the Truman committee) has sud- ly come to life, and is taking a d in the latest war production isis" (page 15). Committee investi- ors have been sent out to sample areas of manpower shortage and plus. Their reports, plus the con- uing committee investigations of a industries such as aircraft and tex- s, will provide the material for full- ss hearings, which may get under by Dec. 1.

•

negotiation Extended

On the request of Army and Navy curement officers, President Roose- lt has used his statutory authority to end contract renegotiation to June 1945, but that doesn't settle the tter.

Price adjustment officials think that is impractical to renegotiate half a r's business (BW—Nov.11'44,p7). xt year when they can see whether orders have fallen off sufficiently to tore price competition, they prob- y will ask Roosevelt to restore the cutoff date (Dec. 31, 1944) retro- ively or go to Congress with a re- st for extension to the end of 1945.

•

rplus Board Takes Shape

Nominees for membership on the rplus Property Board are former Gov. bert A. Hurley of Connecticut, and Edward H. Heller, San Francisco busi- nessman. Slated for the third spot is Sen. Guy M. Gillette of Iowa.

President Roosevelt would have sent Gillette's name to the Senate this week except for a complication which has delayed his appointment and may even take his name off the slate entirely. Under the constitution, a sitting senator cannot be appointed to an office created during his term. Defeated in the last election, Gillette won't be eligible until Jan. 3.

Primarily geographical, the makeup of the new board is a compromise. It is not as conservative as the slate that Jesse Jones tried to sell the President, not as liberal as New Dealers hoped.

Hurley was a vice-president of the Narragansett Machine Co. of Pawtucket, R. I. Last September the House Military Affairs Committee reported that the War Dept. was "open to criticism" for developing and supporting this company.

Heller at present is an Army finance officer stationed in Boston. Before the war he was director of Wells Fargo Bank and several other companies.

Gillette was a strong member of the Senate farm bloc, but went down in the Iowa landslide for the Republican ticket Nov. 7.

•

New Presidential Aide

When Donald Nelson returns from his Chungking mission in mid-December, he will become a cabinet member without portfolio. The White House is authority for the statement that Nelson will advise Roosevelt on both foreign and domestic trade policies. Nelson's retention in a powerful position is regarded as further evidence that Roosevelt will continue to court the cooperation of industry in maintaining a high level of business activity in the reconversion and postwar periods.

•

Action on Antitrust

The Justice Dept.'s Antitrust Division has noticed that numerous defendants who had been stalling on settlement of antitrust cases—apparently in hope that a Republican victory at the polls would change the complexion of Sherman act enforcement—now are coming to Washington prepared to talk turkey.

Reports that the trust busters will henceforth be more chary of consent-decree settlements are not correct, however. Consent decrees will still be used whenever the Antitrust Division can get most of what it wants without a court fight.

•

France Aids War Production

French industry is being lined up by Washington production heads to fill gaps in two critical war production programs: tires and cotton duck. According to Paris reports, French tire plants, experienced in the use of German synthetics, will get U. S. technicians and synthetics for the tire program.

American cotton will be supplied to obtain millions of yards of duck monthly, in addition to the U. S. Army uniforms already ordered from French manufacturers (BW—Nov.18'44,p7).

•

No Civilian Trucks Soon

Farmers and deliverymen won't get any immediate benefit from WPB's order approving manufacture of 10,000 light trucks a quarter for civilian use, the first of this type since the beginning of the war.

Trucks manufactured under the authorization probably won't be completed before the second quarter of 1945.

Meanwhile, the pool of light trucks—which the Office of Defense Transportation has been doling out—is exhausted, except for a few units in the hands of dealers that have been overlooked.

•

To Try for Joint Returns

The Treasury Dept. can be expected to make another, but almost certainly unsuccessful, attempt to secure legislation requiring joint income tax returns by husband and wife, following the Supreme Court's decision this week invalidating an Oklahoma statute designed to establish voluntary community property in that state.

In knocking out the Oklahoma law, the court clearly indicated that it would continue to uphold the basic community property laws of Texas, Louisiana, California, New Mexico, Arizona, Washington, Idaho, and Nevada.

Validation of the Oklahoma statute (BW—Dec.11'43,p32) would probably have provided the easiest way out for the Treasury. Oregon had already passed a similar statute, and many other states were ready to follow next year. Widespread community property would have

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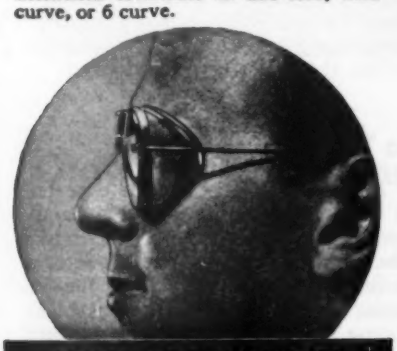

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allowed the Treasury to ask for increased rates for all married couples, to offset the deficit in revenue, rather than for specific legislation designed to meet a particular situation.

•

Wool Subsidy Proposed

A domestic wool price subsidy scheme that would meet the competition of the lower-priced British-controlled fleece coming into the U. S. is brewing in the War Food Administration and on Capitol Hill. WFA would buy the 1945 domestic production at ceiling prices less handling charges, then sell the wool at the price of imported fleece, which is currently 10¢ a lb. below domestic wool.

Applied to 320,000,000 lb. of 1943 and 1944 wool currently held by WFA, plus expected domestic production of 350,000,000 lb. in 1945, the subsidy would cost $67,000,000.

•

Phones for Farmers

The Federal Communications Commission is trying to boost a Rural Telephone Administration to expand phone service among farmers, in much the same way that the Rural Electrification Administration has pushed extension of power lines. Some Administration wheelhorse probably will sponsor legislation.

To start the ball rolling, FCC has brought out a report stressing the fact that while the total number of phones increased from 14,000,000 in 1920 to 23,000,000 in 1940, phones on farms decreased 39%.

•

Capital Gains (and Losses)

A big push is on to put a new national coal stabilization law through Congress this term.

Retired men over 65, who went into war work, will get added social security retirement benefits.

Old currency, previously burned up, will be converted into pulp at the rate of five tons a day, as soon as the Treasury finds a buyer.

—Business Week's
Washington Bureau

THE COVER

Gleaming symbol of modern chemistry is a butadiene storage tank in a Carbide & Carbon Chemical Co. plant, a sphere reflecting science's wartime strides, and a warning to business to prepare for the impact of new things. "What's Coming in Chemicals," a Business Week Report to Executives, starts on page 53.

Tomorrow's gauge

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HE OUTLOOK

SINESS WEEK
VEMBER 25, 1944

This is no time to let down. Industry is failing on a relatively small but important part of war production (page 15). **The battle to control inflation —on wage and price fronts—is a long way from won** (page 116).

That's the sum and substance of warnings that have been coming from the high places these last few days.

To finance the winning of the war and to damp down inflation, this Sixth War Loan drive is perhaps the most important of them all.

•

The soft pedal is down on talk of early victory in Europe, of reconversion, of breaking the Little Steel formula.

Gen. Dwight Eisenhower's declaration on Tuesday that his men aren't getting all the stuff they need fits right into the pattern. It simply re-emphasizes **James F. Byrnes'** warning that the lagging munitions programs must be brought up to par or reconversion will be stopped.

Economic Stabilization Director Fred M. Vinson's dictum on holding the price line is on the same target: The war isn't over yet.

So is **Secretary of the Treasury Henry Morgenthau's** statement that price of victory will keep right on rising till the day Germany falls.

As you read such statements, bear in mind that they represent the last effort to get the last ounce of war production within the framework of Washington's basic policy—which is still **to destroy the enemy without ripping up the foundations that are being laid for an expansion of the civilian economy after V-E Day.**

•

Everyone agrees that there still is a tough job ahead. Even so, **industry must not let itself fall to thinking that V-E Day is six or eight months away; it might only be six or eight weeks off.**

If the war continues to go as it has the last few days, recent worry over backward programs will have been wasted.

This is a time for business initiative to assert itself. The easy course is to hunt for a cushion of new war contracts; the hard-headed thing is to push harder than ever on present munitions orders while realizing that the change-over to civilian goods may come any minute.

Don't make your plans in terms of new war business when it's cutbacks you'll probably get.

•

Detroit is by no means agreed that moving war orders into government plants on V-E Day would be the best thing for the automotive industry.

Most companies would rather shift off war work more gradually.

Several plants urge release of a certain number of workers for reconditioning plant and tools and for setting up conveyor lines. They say this can be done without interfering with war output.

Such preliminary steps, they are convinced, would improve morale of labor because of the implicit promise of jobs.

•

Substantially more steel sheets will be available for war uses—and ultimately for civilians—in the near future.

This results from sharp reductions in allocations to the Maritime Commission's ship program, predominantly in the form of plates. The commission's allocation was 1,800,000 tons of steel for the final quarter of 1944; the trade hears it will shrink to less than half next year.

The steel industry's continuous mills can be shifted from plates back

to their regular product, strip for sheets, in a matter of just a few days.

Mills have had salesmen out booking orders for delivery after V-E Day for some time. The cut in Maritime Commission needs, even though other claimant agencies will take some of the steel, should hasten deliveries.

•

Don't worry too much over stories of Russia's large machine tool orders crowding yours out. **If tool builders are unable to meet the reconversion demand of American industry, it won't be on account of Russian business.**

Russia has been buying for several months for delivery by July 1, 1945. Volume of this business has been no larger than in earlier years.

Main concern of most tool builders, in fact, is where they will get the manpower to make the equipment needed for civilian goods.

•

Industry's researchers look forward with a good deal of relish to the new jobs to be tackled after the war (page 53), but leading scientists view with suspicion the projected government activities in their field.

Industry men approve heartily the Office of Scientific Research & Development's wartime achievements. They think it should go forward in peacetime—working on projects for the armed services.

Frequently, however, it has been suggested in Washington that this or a successor agency should branch out into general research. Such a policy received support from the President this week when he indirectly suggested federal research to create new fields of employment.

That type of government program, industry men fear, would put a damper on the incentive of their researchers.

•

Prospects of an uncomfortably tight situation in linseed oil (BW—Sep.2'44, p10) **now are confirmed by the Dept. of Agriculture.**

Even though we had an exceptionally large carryover of linseed oil on July 1 (336,000,000 lb.), the department expects "stocks of oil will be severely reduced by mid-1945." This is due to a 50% cut in United States production of flaxseed in 1944 and an even sharper reduction in Canada.

Archer-Daniels-Midland Co., largest crusher of linseed, in a recent analysis, **estimated that stocks might be down to 44,500,000 lb. by the middle of next year.** (That allowed 200,000,000 lb. for Russia.)

It would be simple to avoid drawing supplies down to such a low level; we could import Argentine flaxseed. We probably will do that only in extremity, however, unless Argentina changes its government.

•

Something new is brewing in the steel industry. United States Steel Corp. is studying the possibility of a mill at tidewater in the East.

Primary reason is that Bethlehem Steel, through its mill at Sparrows Point, Md., can lay down finished steel in some eastern markets cheaper than Big Steel can from Pittsburgh because of freight.

Bethlehem brings ore to Sparrows Point from Chile and Cuba and has large concessions in Venezuela. U. S. Steel, so far as is known, has no such source of ore. (Britain has the inside track in Brazil.)

However, if ore proves a problem, the committee studying the project for Big Steel might recommend simply a finishing mill.

Just as a guess, lower freight rates might cause Big Steel to forget the idea altogether. Pittsburgh needn't worry too much yet, anyhow.

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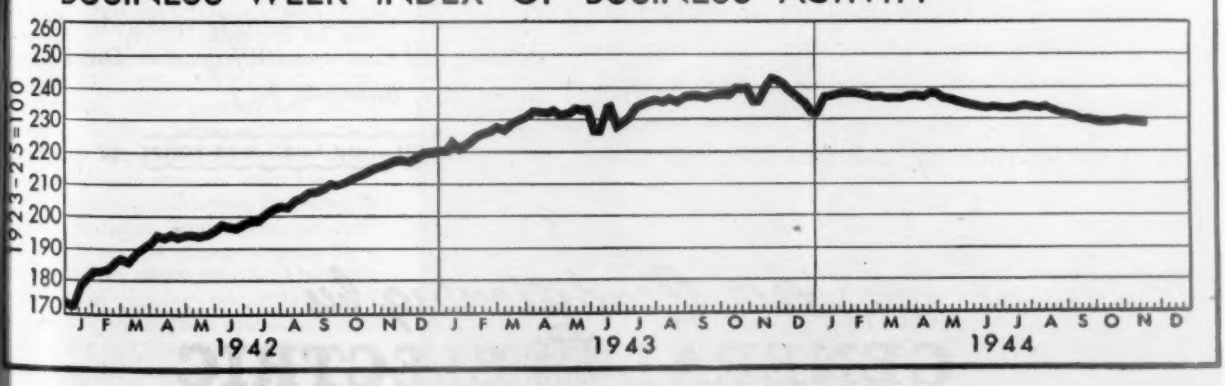
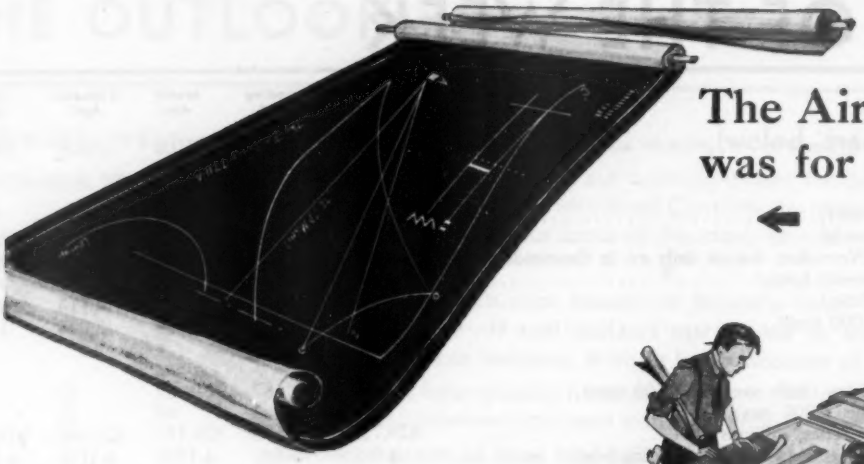
FIGURES OF THE WEEK

	§ Latest Week	Preceding Week	Month Ago	6 Months Ago	Year Ago
THE INDEX (see chart below)	*230.0	†230.3	230.6	236.8	243.8
PRODUCTION					
Steel Ingot Operations (% of capacity)	95.4	96.0	96.3	98.4	99.1
Production of Automobiles and Trucks	20,930	20,900	20,660	17,770	18,440
Engineering Const. Awards (Eng. News-Rec. 4-week daily av. in thousands)	$4,263	$4,034	$5,530	$5,786	$9,256
Electric Power Output (million kilowatt-hours)	4,450	4,397	4,345	4,246	4,513
Crude Oil (daily average, 1,000 bbls.)	*4,739	4,727	4,745	4,513	4,414
Bituminous Coal (daily average, 1,000 tons)	1,938	1,992	1,979	2,093	1,955
TRADE					
Miscellaneous and L.C.L. Carloadings (daily average, 1,000 cars)	84	87	87	82	84
All Other Carloadings (daily average, 1,000 cars)	59	62	62	63	58
Money in Circulation (Wednesday series, millions)	$24,717	$24,674	$24,157	$21,846	$19,559
Department Store Sales (change from same week of preceding year)	+9%	+6%	+17%	+31%	+15%
Business Failures (Dun & Bradstreet, number)	13	22	12	28	29
PRICES (Average for the week)					
Spot Commodity Index (Moody's, Dec. 31, 1931 = 100)	248.4	248.4	248.7	250.3	244.6
Industrial Raw Materials (U. S. Bureau of Labor Statistics, Aug., 1939 = 100)	166.2	166.3	166.3	163.9	160.5
Domestic Farm Products (U. S. Bureau of Labor Statistics, Aug., 1939 = 100)	220.8	222.6	225.5	223.6	213.8
‡Finished Steel Composite (Steel, ton)	$56.73	$56.73	$56.73	$56.73	$56.73
‡Scrap Steel Composite (Iron Age, ton)	$17.08	$16.08	$15.67	$19.17	$19.17
‡Copper (electrolytic, Connecticut Valley, lb.)	12.000¢	12.000¢	12.000¢	12.000¢	12.000¢
‡Wheat (No. 2, hard winter, Kansas City, bu.)	$1.59	$1.59	$1.62	$1.62	$1.57
‡Sugar (raw, delivered New York, lb.)	3.75¢	3.75¢	3.75¢	3.74¢	3.74¢
Cotton (middling, ten designated markets, lb.)	21.32¢	21.48¢	21.52¢	21.03¢	19.77¢
‡Wool Tops (New York, lb.)	$1.340	$1.340	$1.340	$1.340	$1.280
‡Rubber (ribbed smoked sheets, New York, lb.)	22.50¢	22.50¢	22.50¢	22.50¢	22.50¢
FINANCE					
90 Stocks, Price Index (Standard & Poor's Corp.)	101.1	102.0	102.6	96.4	89.6
Medium Grade Corporate Bond Yield (30 Baa issues, Moody's)	3.53%	3.55%	3.54%	3.62%	3.83%
High Grade Corporate Bond Yield (30 Aaa issues, Moody's)	2.72%	2.73%	2.72%	2.72%	2.72%
Call Loans Renewal Rate, N. Y. Stock Exchange (daily average)	1.00%	1.00%	1.00%	1.00%	1.00%
Prime Commercial Paper, 4-to-6 months, N. Y. City (prevailing rate)	¾%	¾%	¾%	¾%	¾–1%
BANKING (Millions of dollars)					
Demand Deposits Adjusted, reporting member banks	38,417	37,627	36,614	35,362	32,649
Total Loans and Investments, reporting member banks	54,043	53,570	54,079	50,319	51,989
Commercial and Agricultural Loans, reporting member banks	6,328	6,287	6,136	5,990	6,435
Securities Loans, reporting member banks	2,510	2,504	2,408	1,779	2,294
U. S. Gov't and Gov't Guaranteed Obligations Held, reporting member banks	39,883	39,467	40,197	37,232	37,857
Other Securities Held, reporting member banks	2,877	2,864	2,902	2,851	2,821
Excess Reserves, all member banks (Wednesday series)	1,100	900	918	936	1,096
Total Federal Reserve Credit Outstanding (Wednesday series)	18,807	18,655	17,695	14,382	10,372

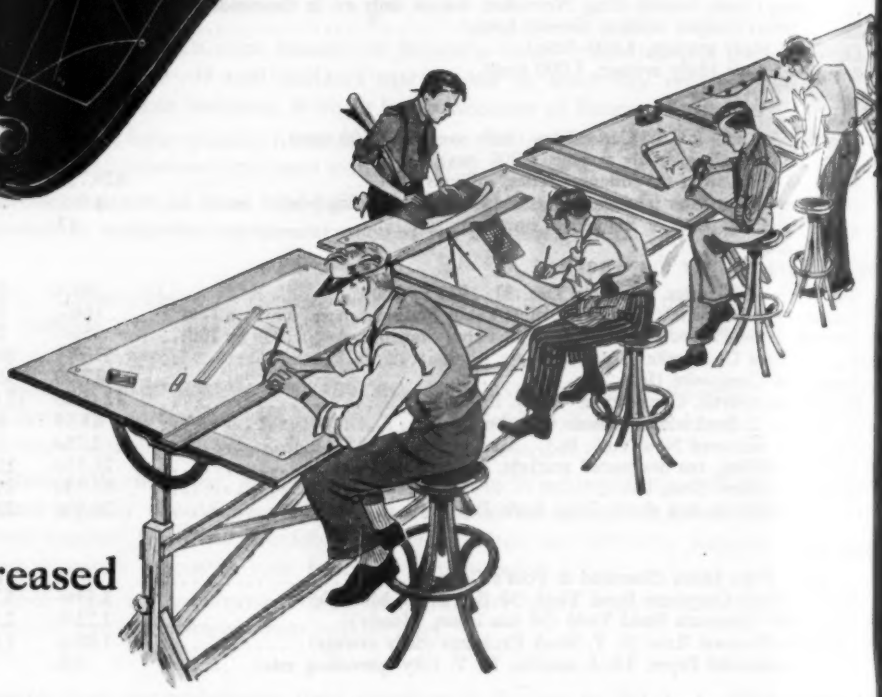
* Preliminary, week ended November 18th.
‡ Ceiling fixed by government.
† Revised.
§ Date for "Latest Week" on each series on request.

BUSINESS WEEK INDEX OF BUSINESS ACTIVITY





The Air Conditioning was for the blueprints.



But their efficiency increased 51.4%

A war plant drafting room was air conditioned — strictly in order to protect valuable blueprints and drawings. (It is well known that extremes of temperature and humidity can have surprising and unpleasant effects on paper.)

Now, nobody even considered the draftsmen who worked there when this air conditioning job was approved. In fact, equipment for "comfort" air conditioning is not now available, and won't be for the duration. Yet the efficiency of the draftsmen increased 51.4% after their drafting room was air conditioned!

The moral is clear. Remember to investigate air conditioning *as a means of increasing human efficiency* in your business after the war.

Better yet, write *now* and we'll see that you get complete information at the earliest possible moment. *General Electric Company, Air Conditioning and Commercial Refrigeration Divisions, Section 4411, Bloomfield, N. J.*

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BUSINESS WEEK

NUMBER 795

NOVEMBER 25, 1944

War Production: What's Critical?

WPB's answer is: 28% of total output, with sudden demand increases and design changes as outstanding causes. Planning for "pinpoint attack," board sees over-all program holding steady.

Simultaneously with the opening of the Allied winter offensive in Europe, Washington this week launched its own winter campaign to stiffen the home front's support of the battlefronts. Even as the progress grimly hacked out by Allied fighting men again renewed hopes for an early victory over Germany, the home-front drive hammered at "the mistaken belief on the part of some people that the war is about over."

• **Krug Sums Up**—With the broadcast appeals of Gen. Eisenhower and Adm. King sounding a note of urgency, President Roosevelt called for fulfillment of the Sixth War Loan drive just as bond redemptions reach a new high (page 32). War Mobilization Director James F. Byrnes warned of "deficiencies in critical war programs" (page 9), and Economic Stabilization Director Fred M. Vinson promised a crackdown on a new upturn in the cost of living (page 5).

Amid this clamor of exhortation, alert businessmen listened most closely to the voice of Julius A. Krug. The WPB chairman, back from a trouble-shooting trip to key cities, came out with an answer to that all-important question for business: "What's the real situation on the much-advertised war production emergency?"

• **Critical Items Listed**—This answer, which has a vital bearing on war production and reconversion policy, is, first, that the critical programs on which the emergency centers comprise 28% of total munitions output. Percentages of specific categories of production placed in the critical area are: aircraft, 19%; ships, 27%; guns, 17%; ammunition, 48%; combat and motor vehicles, 62%; communications and electronic equipment, 36%; other equipment and supplies, only 5%.

That needs qualification, according to WPB's findings. Some items are critical largely because efforts to push them are bound to affect others. Thus, the problem of driving on certain tank models lies not in their production lines but in the fact that any boost may cut down on the output of other needed models that are now up to schedule. Illustration from 1944 experience: Repairing the lag in production of heavy-heavy trucks had to be done at the cost of output in lighter trucks.

• **Some Needs Uncertain**—Furthermore, critical items include some that are now actually up to their theoretical schedules—but their schedules are due for a sharp increase. On several of these, as well as on others that have consistently failed to reach bogeys, the fact of the matter is that there is no way of figuring "additional needs"; these are supplies of which the armed forces can say only that they want all they can get.

In one or two cases, where battlefront requirements are presumably closely estimated—field wire, for example—the demand is soaring far ahead not only of output, but even of "schedule."

• **Familiar Explanation**—What is happening should be an old story: War "needs" are never full met in an all-out war. Always, the armed forces find that they come to need a different type of weapon than they had figured on (heavier guns and shells instead of lighter stuff), or that requirements run above estimates (as on tires and duck), or that new designs make old ones obso-

UNDERGROUND CONFLICT

As the great offensive of six armies bites into Nazi inner defense lines, the Allied stranglehold on Germany's vital industrial area tightens. Included in the growing list of captured properties is a coal mine just north of Aachen. For weeks before the big drive, the mine—smack under the exploding front lines—was held by both Americans and Nazis. In possession of one shaft, U. S. troops (below) guarded German miners in drifts far behind enemy lines. At the other end of the mine the Nazis had trouble mining coal after electric power, in U. S. hands (right), was switched off.

lete (as on tanks). It is the story that lies behind the services' claim that they cannot with confidence reduce their production demands until victory over the major enemy has been won.

● **"Pinpointing" Now Possible**—However, today's munitions picture is fundamentally different from that of 1942 or early 1943—when all munitions programs were "critical" and all were being pushed hard. Since about a year ago we have been in a period of concurrent—and interchanging—increases and cutbacks in demands (BW—Nov. 27'43,p13; BW—Dec.18'44,p15). For an illustration, a year ago output in the vehicle and ammunition groups was being slowed down, while that of aircraft was being boosted to the skies; now, the production curves on the first two groups are headed upward and th on aircraft has fallen by more th 15%.

But there's one important differen from even a year ago. Then, the bu of the munitions program, if not "cri cal," still had some way to go and t cutbacks were limited to small ar ammunition, tanks, escort vessels, a a very few other items. Today mo of the programs are up to needs. T critical area can be pinpointed in th 28%.

● **No General Alarm**—This is the ba for WPB's "pinpoint approach"—n tling up more management know-ho on one program, redirecting the flow components to another, finding labor added facilities for others. The agen is convinced that this is nothing to handled by turning in a general alar It finds that labor shortages are blame in only 22% of the critical cas facilities shortages in only 12%. attributes the trouble to design chang in 26%, and to what it calls "stepup in programs—unexpected emergency d mands—in fully 40% of the tight spo

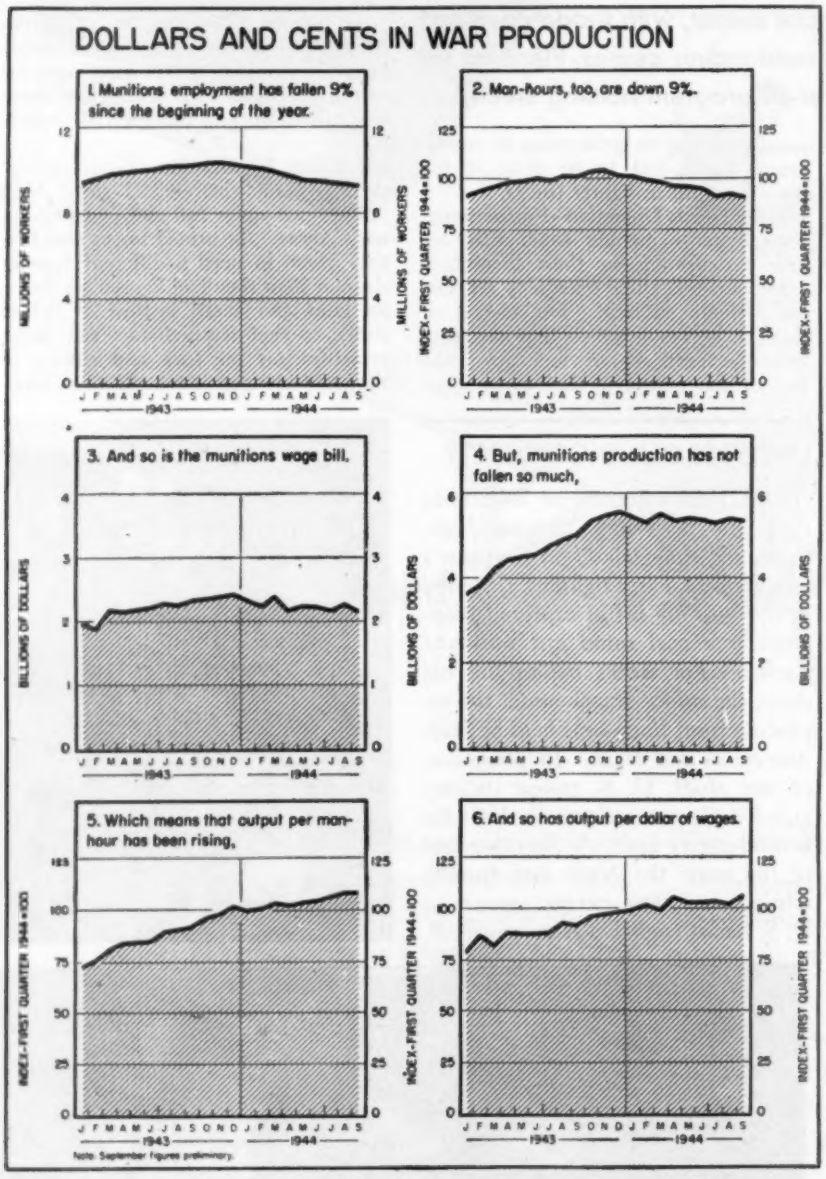
Of course, the stepups call for th provision of labor and facilities, to but even if these were brought to th jobs as fast as the plants could get s for the new demand, the program i volved would still remain "critica simply because that demand had bee stepped up so sharply.

● **Manpower Outlook**—On manpowe there's a range of between 100,000 an 250,000 in estimates of the number additional workers needed in the ne several months to get critical produ tion up to the maximum that th problems encountered in facilities, d sign changes, and stepups will perm

Best opinion leans to the lower fi ure. And there's a strong feeling th declining programs—Flying Fortresse Navy vessels, and small arms ammun tion, for example—and the continue over-all improvement in munitions ou put per man will release enough wor ers to show a further drop in the ov all labor demand for war production certainly not much of a rise.

● **Over-All Output Steady**—As the sit ation stands, all critical items register substantial gains in October and a likely to show increasing ones month month, until they, in turn, are cut ba and other "critical" items are subs tuted.

The over-all munitions production t tal is expected to remain steady. A there is a prospect that, amid the shi ing of war demands, there will be a r lease of labor, materials, and machin which cannot be put to work on critic items and, so, will be available f additional minor reconversion to civili production.


DOLLARS AND CENTS IN WAR PRODUCTION
1. Munitions employment has fallen 9% since the beginning of the year.
MILLIONS OF WORKERS
2. Man-hours, too, are down 9%.
INDEX—FIRST QUARTER 1944=100
MILLIONS OF WORKERS
3. And so is the munitions wage bill.
BILLIONS OF DOLLARS
4. But, munitions production has not fallen so much,
BILLIONS OF DOLLARS
5. Which means that output per man-hour has been rising,
INDEX—FIRST QUARTER 1944=100
6. And so has output per dollar of wages.
INDEX—FIRST QUARTER 1944=100
J F M A M J J A S O N D J F M A M J J A S
1943
1944
Note: September figures preliminary.

While these War Production Board charts clearly portray the over-all situation in munitions production and employment, and show how we have been getting more war production for each man-hour of work and for each dollar of wages, the immediate munitions picture is not so rosy as this picture might suggest. There are still substantial programs in which additional output is critical to the plans and operations of the armed forces. What is clear is that over-all munitions output will continue to run at about the levels of the past year, and that improved efficiency will help to repair the labor shortages which still exist in certain munitions programs.

Ceilings on Hoof?

OPA and meat industry agree on diagnosis of the beef problem but split on proposal for live cattle ceilings.

Less is heard about black market beef now than six months ago. But cattlemen, meat packers, and OPA agree this does not mean that any smaller share of U. S. cattle slaughter is moving through the black market.

A Racket Matures—Categorical statements about the extent of any illegal trade are impossible, since secrecy is the first requisite of any illegal deal. But well informed sections of the packing trade believe that black marketing of beef is expanding and settling down into an established, mature business which attracts less public attention because it is well run.

Beef is the most persistent of all black market commodities. Small slaughterers and oversmart wholesalers are the most important offenders and most retailers engaged in the racket are small fry.

Civilian Supply Drops—Even the relatively stable black market beef trade has its cycles.

The less high-grade beef available to civilians, the more trouble pops. Hence the black market is currently booming; slaughterers of 50 or more cattle a week have to set aside for federal buyers 60% of the four top grades of beef and 80% of cutter and canner grades. This leaves less for civilian consumers than at any time since war prosperity boosted demand above all prewar experience.

How Grades Vary—Also, feed shortages and the price brackets of the Vinson directive send cattle to market in poorer shape than before. Of all beef produced in the months June through August of the past two years, grades varied as follows:

	1944	*1943*
Lower than good	65%	42%
Good and choice	35	58

From this total supply of graded beef, a large proportion of desirable steer and heifer meat goes into military and lend-lease use, further lowering the average grade available to civilians.

Techniques Changed—Black marketing has passed through several techniques, is now out-growing its former crude methods of collecting side money beyond that billed at ceiling to retailers for excess weight.

Favorite variation now is billing for items that are not delivered. Veal is the usual invisible item for making up overceiling premiums, since it is the hardest to check.

• **Retail Violations Surveyed**—If OPA has a reliable estimate of the extent of the beef black market at wholesale, it keeps its information well under cover.

But OPA has been less successful in suppressing the study it made last June of retail beef violations. The survey showed that Boston was the worst U. S. black market city. Its beef prices to the consumer averaged 6¢ per lb. above ceilings. New York, Newark, Philadelphia were close behind. Denver made the best showing, less than 1¢ above par.

In the Southwest, OPA has to fight improper grading by small slaughterers who do their own grading because Washington cannot furnish qualified personnel. OPA now has War Food Administration graders checking about 50 small abattoirs weekly. Prize discovery: Many of these plants, killing only range grassfed cattle, possess no other grading stamp than "AA" to apply to the tough, skinny carcasses they dress out.

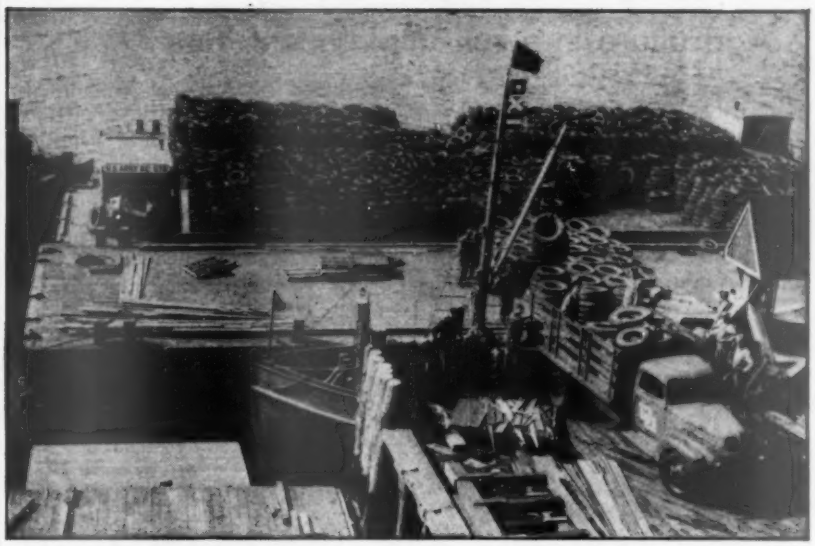
• **Packers Blame OPA**—The root of the black market in meat, industry economists assert, is that OPA has never based its regulations and prices upon the packers' and wholesalers' need to make a living. Big packers claim that they lose from $10 to $25 on each head of cattle slaughtered under present OPA rules, as well as smaller amounts on each hog.

John Holmes, president of Swift & Co., in his last annual report told stockholders that the company lost money on its beef and pork departments and showed net earnings only through good profits on its diversified production in other lines.

The big packer can get by, but often the little packer must cheat or starve. OPA says that gasoline cheaters for profit are chiefly gangsters, rum runners, and narcotic peddlers. On the other hand, it finds that most beef black market operators are solid citizens long established in the meat trade with good reputations.

• **Lost Forever**—Another point of complete agreement between the trade and the enforcement officers is that once a cornfed beef critter worth $16 a cwt. in meat and byproducts at ceiling levels is diverted from lawful marketing by a sharp operator who buys it at $18 on the hoof, no power is capable of getting that beef back into trade at ceiling prices or below.

Eventually someone, either a house-



FROM PATTON TO TOTTEN

From European war fronts whole bargeloads of the Army's battle-damaged tires are arriving at Fort Totten, N. Y., for repairs and reassignment to service. Classified at the rate of 1,500 daily, these casings go through the fort's new 15-acre salvage center where soldiers and private contractors fit them for re-use—if possible. Out of more than 75,000 tires handled since mid-September, Fort Totten has reissued 25% of the better ones for Army service; another 25% went into the rubber scrap heap. Those in between are going to the Treasury Dept.'s surplus disposal office as-is for sale in civilian markets where heavy-duty tires are critically scarce.

Agriculture in a Full-Employment Year

Most economists by now have had their flings at figuring what our economy will look like at "full employment" after the transition from war to peace. But most estimates have been concerned with industry.

Here's one appraising agriculture, presented by H. R. Tolley, chief of the Bureau of Agricultural Economics, before the National Agricultural Credit Committees. It's a picture of what he thinks might happen, say in 1950, "if past statistical relationships, adjusted for evident trends among certain items, continue into the postwar period." (Approximate figures for 1944 are included for purposes of comparison.)

	1944	*Full Employment**	*Intermediate Employment**	*Depression**
Gross National Product	$195,000,000,000	$188,000,000,000	$130,000,000,000	$76,500,000,000
National Income	$155,000,000,000	$150,000,000,000	$105,000,000,000	$57,500,000,000
Cash Farm Income	$20,500,000,000	$17,000,000,000	$12,500,000,000	$6,500,000,000
Net Farm Income	$12,000,000,000	$10,200,000,000	$7,000,000,000	$3,500,000,000
Agricultural Production (as a % of 1935–39)	134	135	130	120
Index of Prices Received by Farmers	191	165	125	75
Index of Prices Paid by Farmers	170	165	140	120
Parity Ratio (Prices received to prices paid by farmers)	112	100	89	62

**Tolley's estimates of the number of jobless are (1) 2,000,000 at full employment, (2) 7,000,000 at intermediate, and (3) 17,000,000 in depression.*

Most conspicuous fact revealed in these figures is that Tolley assumes agriculture's slice of the postwar pie will be smaller, relatively, than what it is getting now. This despite the fact that he figures on production, with full employment, being maintained at 1944 peak levels. The explanation is that he assumes the farmer could sell as much as now if he accepted somewhat lower prices.

In case full employment is not achieved, Tolley assumes that the farmers will sell a good bit more than they averaged from 1935 to 1939 even though national income falls below the average for that period. Here, too, his answer is lower prices. If Congress should undertake to maintain farm prices at parity with other prices, people obviously would not be able to buy as much.

wife whose husband's boss is coming to dinner or an ex-speakeasy restaurant, will pay above-ceiling prices for those steaks and roasts, and even for the less desired cuts that end up as hamburger.

• **Disagree on Solution**—Industry experts and hold-the-liners thus generally agree on the diagnosis. But they part company in prescribing a cure for the trouble.

OPA is convinced that the only real way to prevent violations at wholesale is to put ceilings on live cattle. Thus, it says, when a beef animal brings too much money, the buyer can be nailed for a price violation.

The big packers, to serve their peacetime customers and fulfill their government contracts, have been forced to outbid black marketers for cattle, paying more than they can possibly get back. OPA believes that the honest packers would welcome a live cattle ceiling, but packers above reproach scream that if OPA finds it impossible to enforce prices, grades, and weights in the dressed meat trade how on earth can live-animal grades and prices be enforced? Even the most expert cattle buyers, they point out, honestly disagree on grades every market day of their lives.

• **WFA Opposes Ceilings**—War Food Administration, professionally tender toward ranchers, bitterly opposes live-cattle ceilings. So does Administrator Marvin Jones, who comes from Amarillo, in the heart of the cattle-raising Southwest.

Stockmen and packers know that to impose an official live-cattle ceiling under the price stabilization law, OPA would have to get WFA's countersignature and Judge Jones' approval. But a little over a year ago Fred M. Vinson, Director of Economic Stabilization, established "common law" ceilings on live cattle through a ruling that packers buying above specified maximum prices would be penalized proportionately when the time came to collect their subsidy payments (BW—Oct. 30'43,p14).

• **Fear OPA "Quickie"**—And some few suspicious souls in the industry are just a mite afraid that OPA may try to pull a quickie by simply announcing that these "subsidy" ceilings are de facto price ceilings and have been all along. And if Vinson—as suspected—is sympathetic with OPA's view that this particular end would justify any means, however slick, there is a 100-to-1 chance that the trick might work.

Egg Stamp Plan

Indirect consumer subsi planned by WFA to give pr inducement to buyers witho lowering price to farmer.

The scrambled thinking which h been going on in Washington in t past year on the gigantic egg surp which has been a major worry poultrymen may resolve into an in rect consumer subsidy that might b come a pattern for handling surplu of other perishable food commoditi

• **How It Will Work**—War Food A ministration officials have said nothi publicly about it, but the plan wo operate something like this:

During the big egg surplus mont of May and June, consumers purchasi eggs would get a rebate of up to 10 doz. on the purchase price by presenti an OPA "spare" ration coupon to the tailer. The rebate could be taken the consumer in cash or merchandise.

• **Into Consumer Channels**—WF would in turn purchase the stamps fro the retailers. This, WFA officials s would be cheaper than governme purchasing of eggs, because handlin storage, and transportation costs wo be avoided and no spoilage losses s fered.

But more importantly, instead just sidetracking the surplus egg pro lem, the plan would help solve it putting the commodity while still fre into consumer channels with a price i ducement. The food agency has be having difficulty selling its storage eg on the market.

• **Resembles Stamp Plan**—Every co sumer has a ration book, and the spa stamp plan would work like the s plus food stamps by which the Surpl Marketing Administration supplied pe sons on relief with surplus foods throu regular trade channels in such a mann that the plan was generally acclaim by business and the public alike (B port to Executives; BW—Feb.1'41,p2

As many as three spare stamps wo probably be made good by OPA ea week during the months of May a June. The stamps are numbered, so o trol would present no great problem.

• **WFA's Reasoning**—WFA's thinki on the egg stamp rebate plan goes som thing like this: Most families consu eggs on a price basis. When eggs a cheap, housewives buy more; when th are expensive they consume less.

But with a 90% of parity suppo price to farmers, egg prices are high f most consumers even in the flush peri of May and June. It is for this reas

at consumers have not purchased all e eggs they could and would con-me. That is why, officials believe, the bate stamp plan would be effective in oving eggs into consumer channels.

Support Prices Stay—The food agency ould continue to stand back of its 0% of parity support price and would ep into the buying market if eggs n't move fast enough through con-mer channels.

The plan is not regarded by officials Washington as violating the ban on w subsidies which was written into e stabilization extension act, because e money would come out of funds ailable for the whole support program. FA might go to Congress, however, r a determination of the amount of e rebate; whether it shall be 10¢ a oz. or maybe something less.

If the plan works on eggs, other erishable food commodities might be andled in the same manner. The plan ould be set in motion on any com-odity overnight.

Bounty on Hens?—Another device to ope with the egg surplus—this one de-igned to reduce production—had al-eady received consideration in Wash-ington but has been shelved for the resent at least. Under the proposal, FA would have paid a bounty on ying hens of between 25¢ to $1 a ead in order to induce poultrymen to ill their flocks.

But the Dept. of Agriculture figured at the number of layers on farms ould probably be 7% to 10% less than year earlier anyway, and that produc-ion of eggs in 1945 could be expected o be 8% to 12% less than in 1944.

More for Civilians—But the predic-ion that egg production would de-crease next year below 1944's record high did not mean that there would be fewer eggs for civilians.

The Dept. of Agriculture explained that lend-lease requirements for dried eggs in 1945 will probably decline significantly from that of the three preceding years when about 15% of the total egg production went for dehydration purposes. And with the government now having large stocks of egg products, a greater proportion of the 1945 production will be available for civilian consumption than was the case this year.

In anticipation of a surplus, OPA is reported to be preparing to suspend price control on eggs in January. The action would make eggs the first major food commodity to be brought out from under price control.

ital factor in bringing television re-ivers to popular price levels is the evelopment of a precision molding ess technique to produce hitherto stly astronomical correcting lens om plastic—and on a mass basis.

Television Lens

New RCA receiver boasts larger image, less distortion, through use of plastic lens. New process to cut costs.

After months of quiet, careful grooming in its laboratories, the Radio Corp. of America has ready for public announcement in the near future an entirely new type of television receiver, which it counts on to answer many of the criticisms leveled at prewar models.

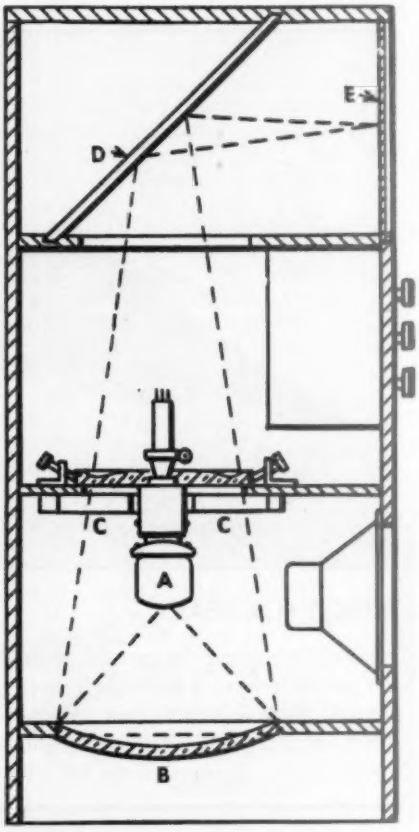
• **Cuts Distortion**—The size of the image will be three or four times larger, and it will be reflected on a flat screen, eliminating distortion, instead of on the rounded end of a cathode-ray tube that made some distortion inevitable. Those few who have been invited by RCA to see the new set in operation at ultraprivate showings report that the television pictures have greater clarity and better definition—less eye strain for the viewer—than 16-mm. film projected on a home movie screen. Finally, on a prewar price basis the new, improved set could actually be made cheaper.

RCA is obviously banking heavily on the new model in its fight to keep television on the prewar frequencies. Potential customers will be less disposed to wait for the improved television which is promised after the war on higher frequencies (BW—Nov.18'44,p36), and RCA will presumably be able to cash in more promptly on its $15,000,000 investment in television development.

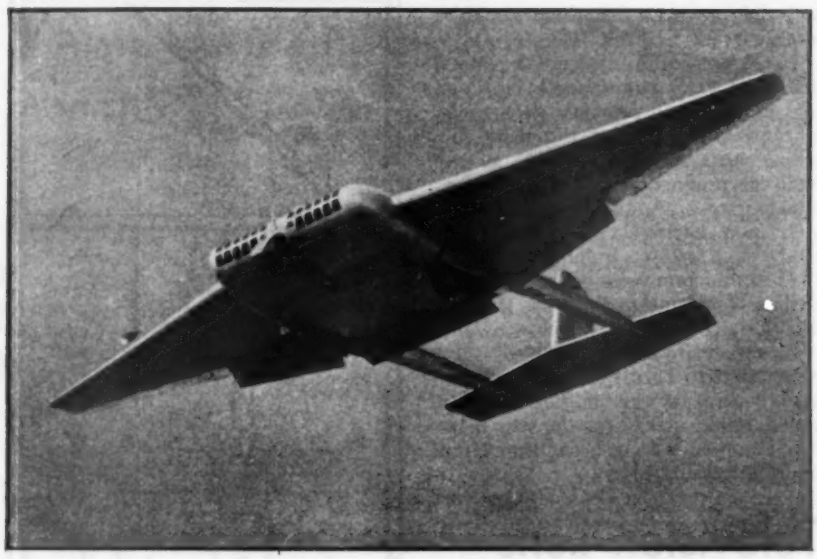
• **Lens From Plastic**—RCA's development of a new process for molding large lenses economically from clear plastic is what makes the new receiver possible.

The optical principle of the new projection television system has been used by astronomers for many years, but the high cost of the special hand-ground correcting lens has hitherto made the system feasible only for elaborate theater projection television systems such as were demonstrated before the war. This high cost has been overcome by the development of machines for making aspherical molds in which the required plastic correcting lenses are produced.

• **No Polishing**—The molding process consists of applying high pressure to a clear thermoplastic material such as Lucite or Plexiglas while it is confined in a heated mold. After cooling, a hole is bored in the center of the plastic lens to accommodate the neck of the cathode-ray television tube. The lens



Cabinets of new home television sets are to be no deeper than ordinary floor-model radios, yet have an 18x24-in. picture screen viewable essentially without distortion from any point in a room. A tiny but brilliant image on the face of the cathode-ray tube (A) is projected down, magnified by spherical mirror (B), then reflected up through correcting lens (C) onto flat mirror (D) which reflects the image onto translucent viewing screen (E).



WINGS FOR PEACE

Radically designed for possible post-war cargo service is the new experimental glider which is now off the secret list after exhaustive test flights by the Army. Designated the CG-16, this motorless craft contains two freight compartments big enough to handle a jeep—in the flying wing. It was developed for Airborne Transport, Inc., an affiliate of Chicago's General Transportation Corp., and will not be used in this war.

is then ready for use, with no polishing or finishing required.

Though softer than glass, the plastic lens has slightly better optical qualities.

• **Magnifies and Reflects**—In astronomy, spherical mirrors are used in the Schmidt camera for star photography. Distortions inherent in this mirror are corrected by an aspherical lens mounted at the center of curvature of the mirror. In the television adaptation of this principle, the spherical mirror is used both to magnify and to reflect the image produced on the 3-in. diameter fluorescent screen of a small cathode-ray tube (see diagram page 19).

The image so reflected is passed through the special plastic lens to correct the spherical aberration of the mirror and thus make straight lines straight. The flat mirror at the top of the cabinet merely changes the direction of the light rays, so that the image appears on the translucent vertical screen set into the front of the cabinet.

• **Vertical Method**—Projection television systems require a long light path. By positioning the cathode-ray tube, mirror, and lens in a vertical arrangement and using the 45-degree reflecting mirror, the necessary distance of 5 ft. or more is obtained with a cabinet depth of about a foot. The 3-in. tube for the new set had a prewar price of $18, compared with $75 for the 10-in. tube used in earlier sets.

Processors First

Men who prepared it are biggest buyers of surplus food offered by WFA. Wholesalers are given third option.

An analysis of five months' sales of surplus government-owned processed foods, amounting to more than $22,000,000, discloses that the men who processed the food—rather than the distributive trades—have been the biggest buyers.

• **Processors First**—That is the way the War Food Administration wanted it. All surplus processed food sold by WFA is first offered to the original processors; remaining quantities are then offered to processors of the same or like commodities. Any such food not sold to processors is then offered to wholesale distributors and chain stores. Jobbers are used in the distribution of odd lots.

A breakdown of sales reveals that 92% of the surplus canned vegetables have been resold to processors, 5% to wholesalers, and 3% to chain stores. In some cases the processors involved were owned by chain stores.

• **Corn Is Sold**—An offering of 391,214 cases of canned corn, announced last April, was one of the first and one of the largest to date. All but 138,500 cases were sold to the original processors. This remainder was then offered to all processors, but only about 22,500 cases were sold. The unsold corn has since been sold. WFA suspects that some processors were slow to accept the offerings because they felt that the corn could be purchased later at an under-ceiling price.

• **OPA Prices Adjusted**—All offerings are made at current processors' OPA ceiling prices on civilian sales, less 6% to cover cost of handling, warehousing, other charges and profit, and an additional discount for relabeling and any reconditioning necessary for sale in commercial channels.

The price paid on WFA purchases is the OPA ceiling price at that time less 4%, plus any subsidy which the processor has paid to the grower under a price-support program. In cases where the prices paid by WFA were less than the ceiling prices that prevailed at the time of resale to the processor, WFA presumably would stand to make a profit, but practically it doesn't work out that way because of some deterioration in quality during the period that the goods are in government possession. Canned snapbeans, for example, that may have been purchased as extra fancy will have deteriorated to standard quality in two years' time. This is determined by inspection before WFA establishes the price at which the goods will be reoffered.

Dried fruits represent one of the largest items of processed food to be returned to the civilian market; 73% of the surplus has gone back to the processors, 25% to industrial users (these were raisins that went to wineries), and 2% (two carloads of dried apples) sold to jobbers.

• **Behind the Surpluses**—The causes for surpluses and changing requirements are as varied as the items which have been sold.

For example, large excess quantities of condensed milk (now almost entirely disposed of) piled up as a result of heavy sinkings of cargo ships early in the war.

It had been decided that England's milk shortage should be made up by the shipment of condensed milk from the U. S. But the shortage of shipping space, caused largely by the U-boat warfare, necessitated a shift from condensed milk to powdered milk. But before production of condensed milk could be halted and the necessary equipment to produce dried milk installed, a great surplus of condensed milk piled up in government warehouses in the United States.

• **Sell Here, Buy There**—An increasing number of odd lots are being sold, amounting sometimes to only one car-

cass of meat and a few pounds of this or that. These odd lots occur when military posts are closed and there is not enough surplus food involved to pay for having it transported elsewhere.

WFA occasionally sells a product in one locality and buys the same grade and quantity some place else. Recent transactions of this character occurred when sales on the Pacific Coast were balanced by purchases on the Atlantic Coast. This operation saved the cost of freight and also the use of transportation equipment.

On other occasions government sale and purchase of approximately the same grade and quantity of a particular item occur in the normal process of turning the stocks.

Basic Issue

Nevada's magnesium plant shuts down as political promises fall by the wayside. It's a blow to state's industrialization.

Basic Magnesium, Inc., which a few days ago made its last ingot of magnesium on orders of WPB, is a Nevada political issue, and as such it becomes part of the Far West's whole political campaign for an industrialization that will outlast the war.

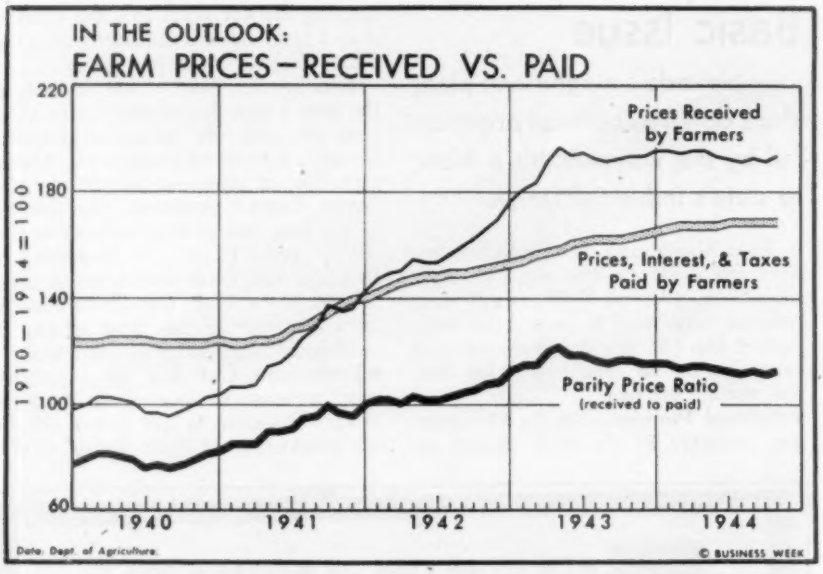
• **Political Promises**—Pat A. McCarran was reelected to the U. S. Senate by carrying the key votes of Clark County (Las Vegas) upon promises to keep the Basic Magnesium project going.

Berkeley L. Bunker was elected as the state's only Representative in Congress on a Nevada industrial platform; he made a point of denouncing Aluminum Co. of America, accused by the Justice Dept.'s Antitrust Division, in action that ended in a consent decree (BW—Apr.25'42,p20), of conspiring to fix prices and limit production of magnesium. Gov. E. P. Carville of Nevada likewise promised his best efforts to keep Basic Magnesium in operation.

• **Production Cut**—But all arguments were necessarily doomed in view of WPB's decision to cut down sharply the production of light metals (BW—

ORGANIZED GOODWILL

Striving for better public relations, many labor unions are assuming new responsibilities to their communities. At Portland, Ore., for example, Willamette Lodge No. 63 of the A.F.L. Machinists' Assn. is building goodwill inside and outside its ranks by donating tools and memberships to war veterans, by getting behind every patriotic drive. Thus the association has spent $15,000 from war-swollen funds for such advertising support as a billboard campaign for war bonds (above) and poster appeals for Red Cross blood donors (right). The union's pride and a public attraction is the $10,000 Victory Center erected by the machinists in downtown Portland (below) as a place for holding bond rallies. In addition, the union has set aside $1,500 for removal of the center after the war.



Farm prices ran away from the cost of the things the farmer has to buy prior to President Roosevelt's hold-the-line order in April, 1943. Since then, however, the situation has been more or less reversed with the result that the "parity" ratio (relationship of prices paid by farmers to those received) has been declining. Congress, meanwhile, has legislated support prices under individual farm commodities between 90% and 100% of parity—has, in short, undertaken to nail the level of farm receipts onto the cost index of things bought. These support programs will become increasingly significant from now on as scarce consumers' goods tend to rise during reconversion while surpluses will retard many farm prices.

Sep.9'44,p38). Operations at the big Basic plant near Las Vegas are now restricted to production of caustic soda and chlorine, which requires a crew of only 800 men.

But the fight has only begun. The day after B.M.I. molded its last ingot, McCarran opened West Coast hearings by his joint congressional committee on decentralization of industry. The McCarran thesis calls for more and more federal money, like that which brought B.M.I. into existence.

• **Favors a Freeze**—McCarran also advocates freezing eastern industry at present volume so that all future expansion will have to go westward.

But business leaders, including heads of the San Francisco, Los Angeles, and California chambers of commerce, brushed aside the freeze idea as a piece of too obvious sectionalism and the dole as unwanted. In effect, Nevada was left to fight its own battle.

Howard Eells' Basic Refractories of Cleveland was the original promoter of Basic Magnesium. In October, 1942, before the plant got into production, the Eells group was ousted at the instance of WPB officials, and Basic Magnesium became a subsidiary of Anaconda Copper Mining Co.

• **British Alliance**—Anaconda paid Eells and his associates $75,000 for their 52.5% stock interest in the project for which the Defense Plant Corp. supplied plant and land to the tune of more than $135,000,000. In connection with the deal, DPC paid B.M.I. $450,000 for nearby ore lands.

Eells had arranged a working alliance with the giant British chemical combine, Imperial Chemical Industries, Ltd., and its affiliate, Magnesium Electron, Ltd., before the project got under way. Last week, Magnesium Electron's technical experts packed up and started back to England, but C. J. Barnsley of Imperial, who represents British interests on the board, remained to consult with Anaconda officials about the future of the project.

• **SWPA Must Decide**—Fundamentally, that depends on the action of the Surplus War Property Administration and Congress, for magnesium plants are one of the categories of war industries singled out for special treatment.

SWPA must draft a plan for their distribution and submit it to Congress for approval. If Congress doesn't specify a policy to the contrary, after the plant is declared surplus, Basic Magnesium will for six months enjoy a right of first refusal at a price set for DPC by a board of arbiters.

• **Costs Decline**—The record of the plant is one that prospective postwar operators might well find attractive. Its peak rate of output was in March, 1944, when it ran at 110% of rated capacity—and capacity is rated at 112,000,000 lb. a year.

Most importantly, DPC reports that costs were going down steadily until production was cut, and DPC shares with the plant's general manager, Frank O. Case, the belief that with more experience they might have been cut even below the level of 18¢ to 19¢ a lb. which was achieved last July, although probably not down to the industry low of 11.5¢ a lb. which the Dow Chemical Co. boasts at its plant in Velasco, Tex.

• **Antitrust Question**—The monopoly issue, which has plagued both Alcoa and Dow for years, is revived with the closing of Basic, for Henry Kaiser's Permanente Corp., Ford Motor Co., and some other magnesium metal producers suspended operations even earlier.

Testifying before the Truman committee this year, Dr. Willard H. Dow blasted away at the allegations of the original antitrust actions, which charged Dow, Alcoa, and American Magnesium Corp. (an Alcoa subsidiary) with price fixing, restraint of competition, and retarding the use of magnesium.

He specifically denied charges "that Dow kept the price of magnesium at one and a half times the price of aluminum, and this kept down the sale of magnesium," and he stated that American Magnesium Corp. reached its decision to cease magnesium metal production in 1927, "without any agreement or understanding."

• **Patents Transferred**—The antitrust records show that several years before the war, Alcoa and the German dye trust, I. G. Farbenindustrie, formed Magnesium Development Corp., to which I. G. transferred its production and fabrication patents. Dr. Dow told the committee that these patents "were never used in this country until Basic Magnesium took them up for a Defense Plant Corp. contract."

To settle a patent dispute that developed between Alcoa and Dow, Dr. Dow continued, a sales contract was signed in 1933 in which American Magnesium agreed to buy not less than 1,500,000 lb. of magnesium metal during five years, stipulating a price of 24¢ a lb. for 750,000 lb. or less a year, and as low as 19¢ if sales went above 6,000,000.

• **Agreement on Prices**—Dow agreed to charge itself the A.M.C. metal price in pricing its own castings, and to charge other customers using less than 1,500,000 lb. a price 1¢ to 4¢ a lb. higher than the price to A.M.C.

...A NEW PAYROLL PROBLEM FOR YOUR BUSINESS!

The growing problem of fast, efficient payroll handling will become further complicated on January 1, 1945, when the individual Income Tax Act of 1944 goes into effect. Determining employees' taxes to be withheld from wages will be more complex than it now is.

Because tax determination must come first, less time will be left for actual writing of the payroll. A new peak will develop—unless measures are taken to prevent it.

To help you overcome present payroll writing difficulties and avoid new ones, Burroughs offers a comprehensive new study, "Payroll Peaks," packed with constructive suggestions. Burroughs also offers help in computing employees' withholding taxes on and after January 1, 1945, in the form of government-approved withholding tax tables for weekly, bi-weekly, monthly and semi-monthly payroll periods. You will get much benefit from these latest Burroughs helps. Send for them today.

Send for these FREE helps

"Payroll Peaks"—an unusually comprehensive booklet, graphically describing the growth through the years of payroll peaks—and measures to level them. It discusses several complete payroll plans, their comparative merits and their suitability to various accounting needs.

Withholding Tax Tables—for establishing withholding tax figures as prescribed by the Individual Income Tax Act of 1944, effective January 1, 1945. Printed on heavy card stock, these easily-read bracket tables are a great convenience to employers who elect not to compute the exact tax on each employee's earnings.

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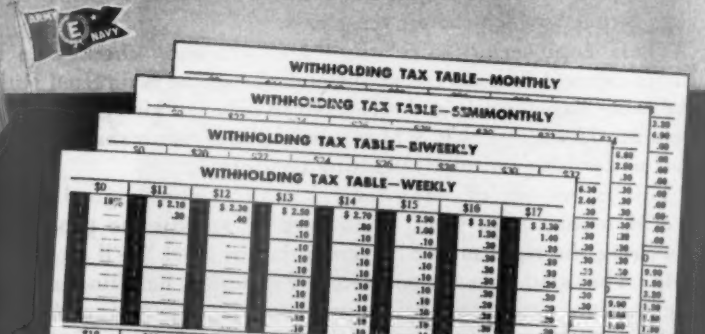

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Maybe this motor *can't* talk. But there's nothing dumb about the answers it gives Robbins & Myers engineers who take nothing for granted, not even their own precise calculations.

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This is but one of many tests that all newly-designed vertical R & M motors must pass. If you are up against the problem of matching the right motor to your job, write us! We'll be glad to help. That also goes for problems of materials handling, converting machines to direct drive, ventilating, or pumping. Address: Robbins & Myers, Inc., Springfield, Ohio. In Canada: Robbins & Myers Co. of Canada, Ltd., Brantford, Ontario.

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Price Equalized

OPA drops differential favor of tires made with ray cord. Finds costs are now higher than for cotton.

Rayon passed a significant milest last week in its race with cotton for preferred place in tire construction (B —Sep.30'44,p64).

In an amendment to RMPR 119, Office of Price Administration revo the price differential between orig equipment tires of rayon and those cotton construction.

• **Rayon for Heavy Duty**—The h resisting qualities of rayon have pro so valuable in tires of synthetic rubb in which frictional heats are higher t in those of natural crude, that he duty types are employing rayon alm exclusively.

OPA's revocation of the differen resulted from a study showing t costs of spinning, weaving, and dipp rayon have been reduced; that la costs have been cut by experience w rayon; that freight reductions have sulted from combined operations in location.

• **Already Eliminated**—The age pointed out that practically all ma facturers who originally were gran rayon differentials had already el nated them. The differential was amount not to exceed the differenc factory costs of tires of rayon over th of cotton.

In prewar passenger car tires, cost factor was a major handicap rayon, but the wartime decrease po to its greatly increased use even w natural rubber is again available.

• **Manpower Down, Output Up**—proved labor utilization has effected increased production of tire cord fabric despite a slight but steady dec in employment.

Employment in 30 tire cord twisting plants in August was 33, off 2% from July. The industry wil quire 5,500 additional workers by March if the production goal of 300,000 lb. a month, beginning in cember, is to be realized.

Ten of the principal plants pro ing high-tenacity rayon yarn had 27 employees on Sept. 1, will need 2 more by next March.

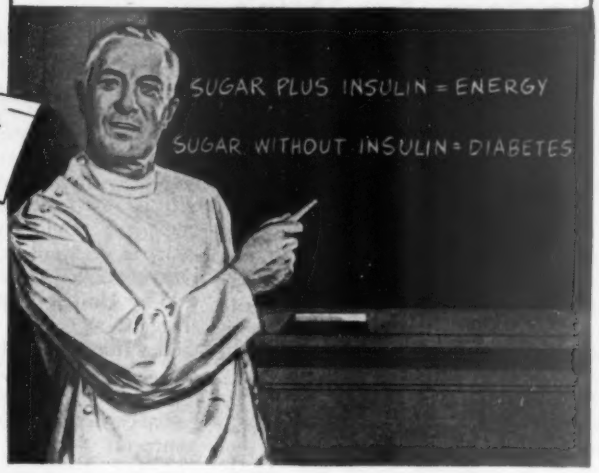
TOURS AT WILLOW RUN

With an eye toward creating g will, and to developing a prospect li potential postwar customers, Ford tor Co. has obtained permission f

The a b c of DIABETES

TO EMPLOYERS: This a-b-c discussion of diabetes makes readers aware of the importance of early diagnosis. Help give it wider circulation among your employees.

Metropolitan will gladly send you enlarged copies of this advertisement, to post on plant or office bulletin boards, free upon request.



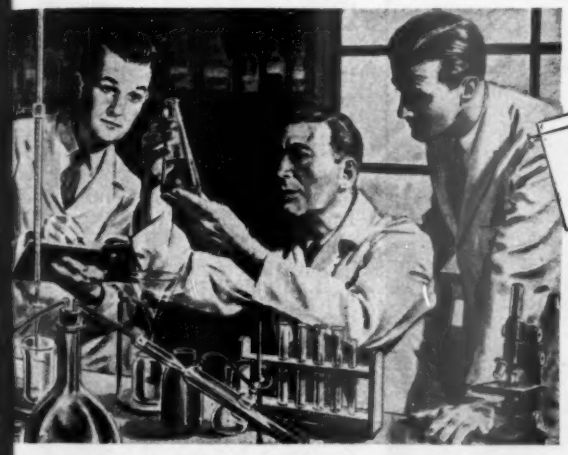
a

What diabetes is. Certain cells in your body — in a gland called the pancreas — produce a substance named *insulin*.

This enters your blood stream and enables your body to store sugar and convert it, as needed, into muscle energy.

Lacking insulin, sugar would simply accumulate in your body. You would become unquenchably thirsty for water to carry this excess sugar from your system — *used, wasted*. You would be constantly hungry because of the calories lost. And even though you ate a great deal, you would probably lose weight steadily.

You would have diabetes.



b

How diabetes is treated. Thirty years ago, if you developed diabetes, your chances of living long would have been rather poor. But today, if you had it, your chances would be good for living as long as you would *without* diabetes.

And you'd probably owe most of these added years to a miraculous discovery made in 1921: that insulin can be extracted from the pancreas of certain animals, and that injections of it permit a diabetic to use the sugar and starches in his diet.

Many advances in insulin treatment have been made since its original discovery. Today most diabetics can live virtually normal lives, with proper diet and exercise and insulin — although not *all* diabetics require insulin.

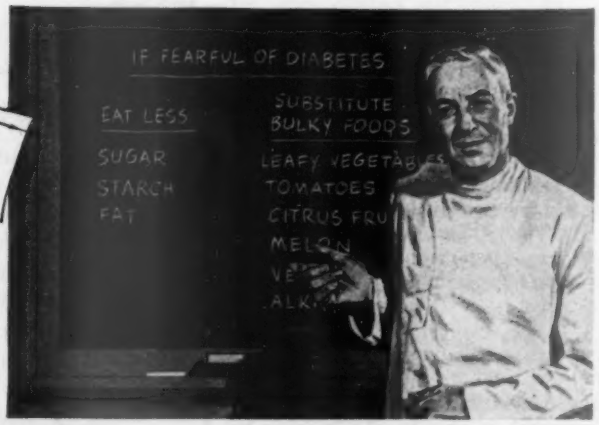
c

How to guard against diabetes. Medical research has revealed who are the most likely victims of diabetes. They are:

Middle-aged, overweight people—Avoid overweight by controlling the amount you eat—limiting the intake of sugar, starch, and fat—and by getting plenty of healthful exercise.

People who have diabetes "in the family"—Predisposition to diabetes is hereditary. Therefore, if anyone in your family has had diabetes, you should pay particular attention to diet and exercise. Above all, have periodic at least annual—physical checkups *with urinalysis*.

Send for Metropolitan's free booklet—"Diabetes."



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the Army Air Forces to open America's most publicized war plant, Willow Run, to public inspection. Guided tours are available four Sundays this month and next, and tickets are available only through Ford, Mercury, and Lincoln dealers in the Detroit area.

Western Air Wins

CAB denies coveted hump route to United Air Lines despite its examiner's recommendation to the contrary.

Over-the-hump flights direct from Los Angeles to Denver, across the 14,000-ft. Continental Divide, won't be begun until after the war by Western Air Lines, which gets the much-sought licenses by action of the Civil Aeronautics Board.

• **Examiner Reversed**—The CAB, in a decision which establishes Denver as a major transfer point and air center, reversed its examiner, who last April (BW—Apr.22'44,p46) recommended that the prize shortcut route go to United Air Lines. Other contenders were Continental Air Lines of Denver, and Transcontinental & Western Air.

Western operates along the West Coast between San Diego and San Francisco; as far north as Lethbridge, Ont.; and as far east as Huron S.D., the latter through a daily round trip out of Denver resumed only last week.

• **Equipment Interchange**—Apart from its own good fortune, Western Air regards the CAB decision as important because it established for the first time a clear-cut ruling in favor of equipment interchange between airlines.

With no such interchange, Western would have to offload all passengers, mail, and freight at Denver into a United Air Lines or Continental plane to continue the trip east. Under the CAB decision, a passenger can board a Western Air plane at Los Angeles and fly to New York or Boston without changing planes.

• **Why It's Delayed**—But the transmountain route must wait until after the war for two reasons:

(1) The 50-passenger DC-6's to be used are on order from Douglas Aircraft, but won't be ready until war priorities are eased.

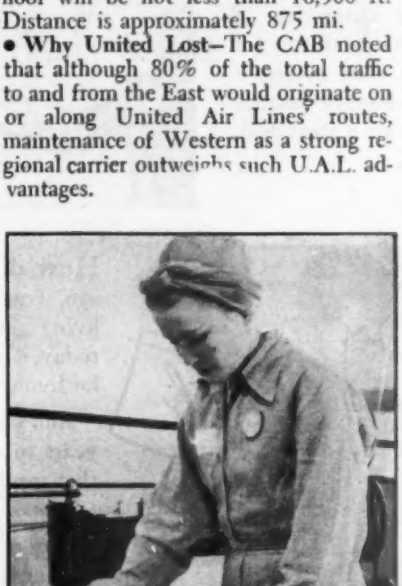
(2) The government has complete plans for installation of modern flight-safety systems all along the line, but high-frequency radio and other such equipment needed for the systems are subject to high priorities for war use.

• **Through Dead Spot**—The flights, when begun, will bisect a spot on the map which is dead as far as transport aviation is concerned. Present east-west flights go either north of the mountains, via Salt Lake City, or south, via Albuquerque and El Paso.

There will be frequent service, both local and express. Through planes will not stop between Los Angeles and Denver. At Denver they will either fly Continental via Kansas City, or United via Omaha and Chicago. In either case, the transmountain flight will cut about two hours off transcontinental schedules, and will assure nine-hour trancontinental service.

Local flights between Denver and Los Angeles, stopping at Las Vegas, Nev., and Grand Junction, Colo., will take between four and five hours. The flight floor will be not less than 16,500 ft. Distance is approximately 875 mi.

• **Why United Lost**—The CAB noted that although 80% of the total traffic to and from the East would originate on or along United Air Lines' routes, maintenance of Western as a strong regional carrier outweighs such U.A.L. advantages.



EXPLOSIVE SEAMSTRESS

Cutting tables and sewing machines are among the less obvious items of equipment used in making propellant charges for trench mortars at Radford Ordnance Works. Under labor-saving methods developed by Hercules Powder Co., a mixture of nitroglycerine and nitrocellulose is rolled out in thin sheets. Cut into squares, the sheets are stacked and sewn together for precise punching into 2-in. squares. These are carefully weighed before shipment to loading plants.

More Streamliners

Railroad men are planning new trains to meet competition after the war. WPB ruling may ease equipment problems.

Cheered a little by WPB's authorization of 250 coaches a quarter next year even though deliveries probably won't trickle through until midsummer, railroad men are beginning to talk about the postwar streamliners with which they hope to meet the competition of airplanes, buses, private automobiles.

• **Luxury Service**—New high-speed trains will be added, and the streamliners of today will be refitted to offer more luxurious accommodations. Improved schedules and better daylight services are being planned, too.

Railway equipment manufacturers estimate that orders for at least 3,000 passenger cars will materialize with the close of the European war, that for five years 3,000 more will be ordered annually.

• **New Diesel Trains**—One postwar order already on the books is that of the Great Northern Ry., which announced last week that it had contracted for five diesel-electric streamliners at a cost of $7,000,000. As soon as the equipment is available, faster streamliner service between Chicago and the Pacific Northwest will be inaugurated (page 96).

Actually, railroad men aren't too hopeful of getting any new passenger cars soon. Car builders can go ahead on passenger equipment only if they have a release from WPB which is granted if the work won't interfere with the war program. Permission has been granted only two or three plants, and deliveries may not start until midsummer. Meanwhile, the roads are getting peacetime programs in readiness.

• **On the Probable List**—For competitive reasons, railroad men hesitate to discuss plans in more than a general way, but here are some of the probables:

Louisville & Nashville R.R.—New streamliner between Cincinnati and New Orleans.

Rock Island Lines—Streamliner service between the Twin Cities and Kansas City.

Illinois Central—Transfer of the "Green Diamond" to the Waterloo (Iowa) service; inauguration of new streamliner between Chicago and St. Louis.

Santa Fe—Extension of streamliner service south from Fort Worth to Galveston, Tex.

Chicago & Eastern Illinois—Streamliner

liner between St. Louis and Chicago.

Southern Pacific—Streamliner to replace its "Cascade" between Oakland, Calif., and Portland, Ore.

Chicago & North Western—Extension of its "400" service to points in Minnesota, Iowa, Nebraska, and South Dakota; new streamliner between the Twin Cities and Omaha over tracks of the Omaha road, a subsidiary.

• **Reviving Some Plans**—A number of proposals under discussion in prewar days are being revived. These include:

Missouri Pacific—Streamlining of its "Sunshine Special" for its through service between St. Louis and Mexico City.

Burlington, Denver & Rio Grande Western, and Western Pacific—Streamlining of the "Exposition Flyer" between Chicago and San Francisco.

More long-distance transcontinental specials are in the planning stage, some of them to be operated jointly over as many as three or four lines. The western lines (map, page 98), now laboring under wartime traffic loads, are proposing several streamliners.

Under discussion is a new train to the Pacific Coast originating on the Rock Island Lines from Chicago and terminating at Los Angeles and San Francisco via the Southern Pacific.

• **Joint Projects**—And streamline equipment may be ordered for the Santa Fe's "California Limited," and for these jointly operated trains: "Los Angeles Limited" and "Overland Limited" by Chicago & North Western, Union Pacific, and Southern Pacific; the "Portland Rose" by C.&N.W. and U.P.; and the "Golden State" by the Rock Island and S. P.

Other prewar plans which may be carried out when the equipment can be obtained include several new streamliners between New York and Florida and between Chicago and Florida.

• **Daylight Service**—With many traffic officials won over to the earnings possibilities of fast luxury type daylight services, expansion in this direction is expected to be substantial. Railroad men believe that New York Central's order earlier this fall for 300 passenger cars may be tied up with an extension of that line's daylight services

POPPY CHARGES DROPPED

Federal indictments charging seven northern California farmers with growing opium poppies without first obtaining a license from the U. S. Treasury (BW—Jul.22'44,p46) were recently dismissed.

None of the California acreage was planted for opium purposes. What the farmers sought were poppy seeds which were eagerly bought by bakeries to replace sesame seeds. So lucrative was

SHIPPING PACKS PROTECTED BY
Acme Steelstrap
... ARE "BOUND TO GET THERE"
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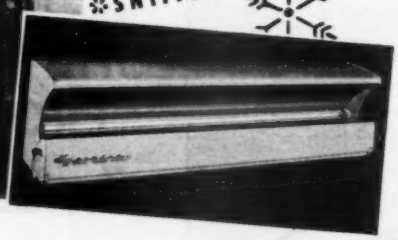
Why do Elevator Operators HATE WINTER?

✻COLDS ✻COUGHS ✻SNIFFLES ✻FLU



Confined in a small space with the general public, every elevator operator is constantly subjected to the attacks of air-borne germs. This may result in a succession of colds and other bacterially induced diseases—absenteeism—sometimes lost pay—certainly sub-standard elevator service.

To effectively combat such air-borne contagion . . . install

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the scientific yet simple and inexpensive method that provides an air purity equivalent to summer living conditions. Air-borne germs are destroyed by subjecting them to the lethal effects of intensified ultraviolet radiation of the correct wave-length.

This system is as adaptable to elevator service as it is to use in any of the other locations suggested below.

Use HYGEAIRE System to safeguard the health of both employees and visitors.

For complete information on this equipment, write or 'phone your nearest Graybar Electric Company office or General Electric Supply Corporation (located in all principal cities).

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Drafting Rooms	Laboratories	Purchasing Offices	

AMERICAN STERILIZER COMPANY

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the business, that an acre of poppies grossed the grower approximately $575.

Last spring narcotics agents found more than 2,000 acres of opium poppies growing in northern California and easily persuaded owners of more than 1,500 acres to destroy their crops. Seven farmers rebelled, on the ground that the 1942 federal opium poppy control act was unconstitutional. Some weeks ago the act was upheld by a three-judge federal court.

Last month the 575 acres of poppies were destroyed, but their valuable seeds had long since mildewed.

On Their Own

Wartime flyers seek CAB approval of postwar franchise for amphibious feeder airlines to serve New England.

More than a year ago a group of wartime flyers on regularly scheduled airline service for the Army between the United States and Australia began to consider their postwar plans. These employees of Consairway Division of Consolidated Vultee Aircraft Corp. talked about operating an air service of their own when the war ends. Plans never progressed far beyond the talk stage, however.

• **Would Use Amphibians**—Now it has been disclosed that another group composed of 30 wartime flyers—Norseman Air Transport Associates—has had similar plans for two years, and is asking the Civil Aeronautics Board for a franchise covering airline feeder lines for New England.

Norseman Associates backs its application to CAB with unique argument. The problem in New England is air hops so short that the advantage of swift flight is lost in the time required to negotiate the distance between airfields and downtown sections of cities served by auto or bus. Norseman would solve this with amphibians which would land on bays, rivers, and lakes from which municipal centers are readily accessible.

• **Eyes Surplus Planes**—Norseman proposes to take over surplus war planes, including the best types of amphibians. On land planes they would install Edo floats which would enable a ship to light either on water or on land.

Norseman is one of some 30 applicants whose hearings before CAB will begin Dec. 4.

Norseman Air proposes a passenger, express, and mail service, the latter using the nonstop pickup technique developed by the late Richard du Pont

BASIC ★ ★ ★

IN YOUR PLANS TO KEEP POSTWAR

MAINTENANCE COSTS DOWN . . .

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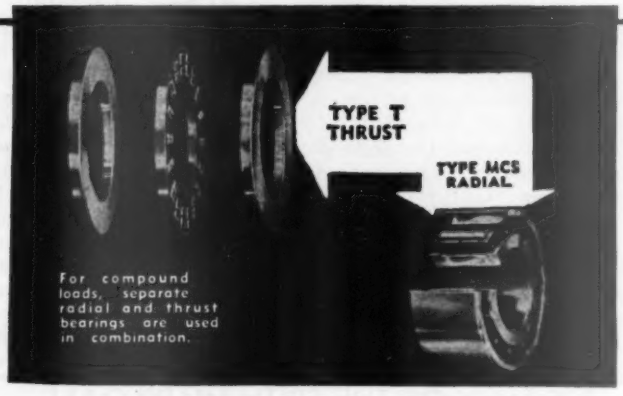
BEARING LOADING



Costs must come down—especially maintenance costs—if you want to weather the storms that peacetime readjustment of prices, markets and competition will bring.

So make a practical start now. Change over your production machinery to Rollway's right-angle bearing loading. That will cut maintenance cost and replacement cost . . . it will free your production machinery from frequent shut-downs for bearing replacements.

Design your postwar products around the Rollway bearing principle, too. You'll get higher load capacity and longer life expectancy in given dimensional limits. You'll get more compact design, a better operating, more satisfactory product with less maintenance trouble.

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Rollway's right-angle Bearings limit the load carried by each bearing to a single load component —either *pure radial* or *pure thrust*. The unit load per roller is lower, the load capacity for a given dimension is higher. No oblique loads or resultants, no compound loads of any kind can pile up to increase the computed load beyond the elastic limits of the structure or housing. Resistance to shock and vibration is increased. Pinch-out of rollers is eliminated—there's less end-rub, less wear-back of roller ends. Longer bearing life and lower maintenance and replacement costs are normal results.

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SALES OFFICES: Philadelphia • Boston • Pittsburgh • Youngstown • Cleveland • Detroit • Chicago • St. Paul • Houston • Tulsa • Los Angeles

through his All-American Aviation (BW—Apr.10'43,p64).

• **Outside Capital Pledged**—Original Norseman associate is Lt. Robert G. Averill of Longmeadow, Mass. He is 23 years old and is navigator on a bomber. Associated with him are other flyers and ground crew personnel. Their plan calls for 2,500 route miles serving 77 towns. Original idea was that the project would be cooperatively financed by the airmen and their friends but they had to call for outside aid.

They have interested a group of Hartford businessmen including Jerome E. Respess, Albert A. La Pointe, and Robert W. Hayes. The three are officials of the La Pointe Engineering Co., Unionville, Conn. (plane accessories), the Industrial Pressing Co., Unionville (plastics), and the Simsbury Flying Service, Simsbury, Conn. These and others are counted on to furnish the $500,000 that will be needed.

• **Difficulties Ahead**—Outsiders predict that the associates have a hard row ahead of them. CAB policy is generally to lean toward big operators already on the job.

But those interested in Norseman hope that Washington will look with favor on a group of servicemen who are doing their own postwar planning.

Workers Polled

Asked what they think of management, factory employees render vote of confidence on the majority of points.

Factory workers generally believe their companies are capably managed, and that by and large employees are well treated. But while they concede that management has the workers' best interests at heart, they give union leaders credit for most of the gains they have made.

• **Unions Criticized, Too**—Prounion sentiment, however, does not necessarily imply hostility toward management, for only half as many factory employees favor changes in management's manner of conducting its affairs as favor changes in union policies.

These findings are included in a survey made for Factory Management & Maintenance, a McGraw-Hill publication, and published in its November issue. They complement an earlier report which showed, among other things, that workers look to government, management, and unions, in that order, to solve the problems of postwar employment (BW—Oct.28'44,p98).

• **Confidence Vote**—The current survey conducted by the Opinion Research Corp. of Princeton, N. J., was aimed primarily at giving management an idea of how it stands with the workers. In seven out of ten cases, workers rate management average or better than average in its principal functions.

Most of the changes others suggested were in the field of labor relations, and the proposals made most often were for closer cooperation between management and labor, for higher wages, and for better working conditions—cleaner, cooler, and better lighted plants, more rest rooms.

• **Boss Not Overpaid**—The majority said that they consider management's compensation is about right. Union members were more critical of bosses' salaries than nonmembers; 26% of the union workers consider management overpaid, as compared with 18% of the nonunion group.

Eighty-nine percent of the workers listed their own wages as good or average, 80% expressed satisfaction with the handling of grievances, 91% said they are provided good tools and equipment, and have good working conditions, and 65% were of the opinion that management's cooperation with unions is good or average (only 14% said cooperation is poor).

• **Better Job?**—But only 34% of the workers said that they saw a good opportunity for promotion to a better job, 35% saw a fair chance, and 25% viewed their future as poor.

Only 38% of workers in the textile, leather, and apparels group said that their wages were good, in contrast to 65% in the chemicals, oil, coal, and rubber products groups.

• **How They Split**—Among all workers polled, 56% said that management has workers' interests at heart. A sharp difference was shown in the attitude of union and nonunion workers, with 68% of the nonunion group considering management favorably inclined toward its workers, as compared with only 51% of the union group.

Twenty-five percent of all workers said that they consider management more interested in the welfare of employees than are union heads, but nearly twice that number, 47%, replied that they consider the union leaders their best friends. Union members voted 14% for company and 60% for union heads, and nonunion workers checked were 47% for company and 21% for union leaders.

• **Foremen Analyzed**—Workers were asked to evaluate their foremen, and 60% rated them good, 31% average, and 8% poor. Sixty-two percent said

When war bond redemptions last month climbed over the $400,000,000 mark, Secretary Henry Morgenthau, Jr., explained the jump as a temporary reaction to the Treasury's new and easier system for handling cash-ins at the commercial banks. The idea was originally expected to "encourage hesitant people to keep their cash reserves in war bonds" (BW—Sep.9'44, p64). But so far, November redemptions have increased again. Actually, that's part of a rising trend—both in total dollars, and as a percentage of bonds outstanding. The redemption rate of almost $5,000,000,000 a year compares with sales of $13,600,000,000 in 1943, and of about $13,000,000,000 so far in 1944—plus the yield of the Sixth War Loan.

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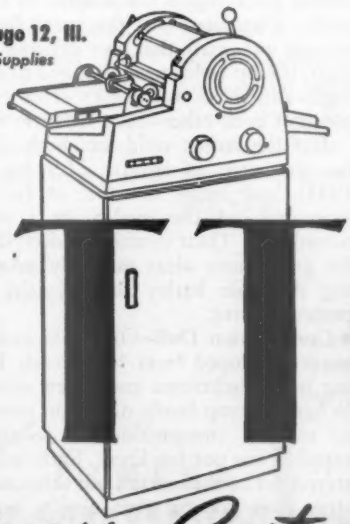

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foremen's pay is about right, 6% said it is too high, and 13% said too low.

The division was sharp again on the question of foremen's unions. Union members were 49% for and 33% against foremen's organizing; nonunion workers were 26% for and 42% against.

Gamble in Barley

The early birds among the maltsters were tricked by damp harvest. They didn't make a killing, but they didn't lose.

Malting companies who early last summer attempted to anticipate their needs for malting barley (used chiefly in beer) by purchasing barley from farmers almost before the seed was in the ground (BW—Jun.10'44,p26) haven't made the killing they hoped for. Nor did they lose their shirts, as some competitors had predicted. They came out about even according to the consensus in Minneapolis, the nation's biggest barley market.

• **Crop Small and Poor**—Reason for this is that the 1944 crop, besides being small (287,000,000 bu. as against 322,000,000 bu. in 1943), is of such poor quality that only a little of it is of malting grade. So the early birds, who bought upwards of 5,000,000 bu. sight unseen, find themselves obligated to take plenty of substandard barley.

Only an estimated 10% of the Northwest's barley crop rates as quality malting barley; another 20% can be called good malting; the rest is commercial barley and feed grade.

• **Counted on Weather**—Buyers of barley on the "to arrive" basis (Fleischmann Malting Co. was the largest) were merely gambling on the weather in their deals. They knew that this year's barley acreage was small, that beer demand was high. If crop yields were low, and quality high—and these two factors often complement each other—they stood to win.

But the barley yield was high (22.7 bu. per acre as against 21.9 bu. in 1943), and heavy moisture at harvest time reduced the quality to a near-record low. Their carefully chosen deals for grain from areas normally producing desirable barley didn't yield expected returns.

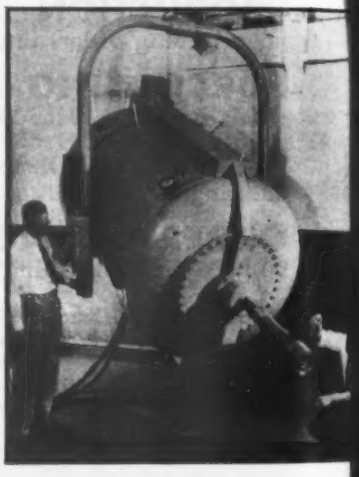
• **Competition Dull**—One unlooked-for result developed from heavy early buying by Fleischmann and a few others. When the crop finally did begin moving to market, competition for available supplies was not too keen. Early buyers stayed out of the market and other maltsters, ever hopeful that quality would improve, didn't press for purchases. So, much of the crop moved into the ha of elevator owners and private merch disers.

It now appears that maltsters, fin aware that they must lower their sta ards and use less desirable barley, have to buy from these "middleme which means they'll pay higher pr to offset storage charges and hand fees. To this extent, therefore, Flei mann and other early buyers are i more favorable competitive position

• **Enough in Sight**—Despite all th troubles, however, malting barley bu say enough usable grain is in sight meet requirements. The war has tau maltsters, as well as brewers and of malt users, a lot of ways to stre supplies.

• **Some Favorite Brands Short**—T breweries have produced an ever creasing flow of beer during the years, up from 55,000,000 bbl. in 1 to about 81,000,000 bbl. in the fi year ended last June. U. S brewe used 70,000,000 bu. of malt for bee the year ended last June 30, agai 63,000,000 a year earlier.

Since 1940, most brands of U. beer have contained less malt and m substitute material. Quantity of m dropped 20% while beer product rose 47%. Many brewers think t have thinned their product about as as they dare



SUPERCHARGED X-RAY

General Electric's new 2,000,000-X-ray machine gets final tests fr two of its developers. With Dr. E est E. Charlton at the controls, W liam F. Westendorp measures el tions at the 5,000-lb. unit's project tube. Capable of detecting flaws steel 2 ft. thick, this big "camera much faster than G.E.'s 1,000,0 volt job (BW—Sep.2'44,p54).

FM recording quality — NOW!

day, teachers and administrators charged with the responsi-ity of buying sound equipment for use in teaching speech, odern language, drama and music have a two-fold task: The uipment they select should provide finer results from today's to 7,500 cycle *AM* broadcasts; and it should also provide finest possible results from today's and tomorrow's 50 to ,000 cycle *FM* — the new type static-free broadcasting that becoming increasingly available.

Fairchild has built for both *AM* and *FM* recording — *now!* d like all responsible manufacturers, Fairchild demon-ates the performance of its portable recorder equipment — *not on an approximate hearing basis* — but on a basis of scientific measurement. Carefully determined *curves* and *light patterns* are available to show frequency response, distortion content and other measurements of the basic units as well as overall characteristics.

Educators are fully assured that the equipment they're buying represents an educational investment of unquestionable value.

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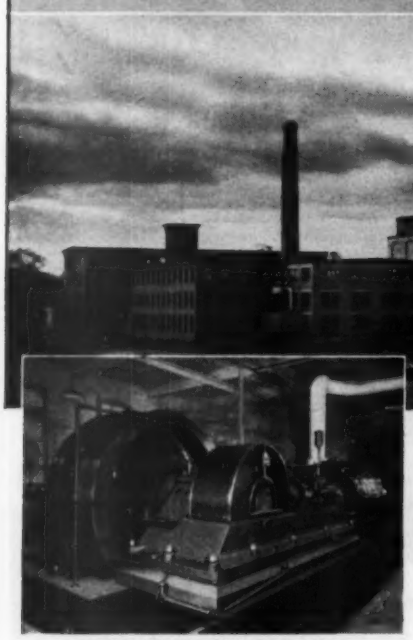

Merrimack Woolen Mills, Dracut, Mass., and the 750-kv.a. Skinner "Universal Unaflow" engine-generator unit.

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M. T. Stevens & Sons Co., of North Andover, Mass., was founded in 1813, by the grandfather of Nathaniel Stevens, now president of the company. In that same year Lawrence met his death on board the "Chesapeake" outside Boston, and Perry won his victory on Lake Erie. It was the next year that Francis Scott Key penned our national anthem.

Through four great wars, and now in the fifth, this old reliable company has been furnishing fabrics for uniforms and other military purposes, and making millions of blankets for the armed forces. Stevens woolens and worsteds have an enviable reputation throughout the men's and women's wear and automobile upholstery trades.

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A remarkably large percentage of our business comes from those who already have Skinner engines. M. T. Stevens & Sons Co. is a typical "repeat" customer. In addition to the "Universal Unaflow" engine which generates electric power for Stevens' Merrimack Woolen Mills, there are four of these engines in their Minterburn, Hockanum and American Mills at Rockville, Conn.

More than 2,000 power users, in industries and institutions of various types, have found it more economical to generate their electric power with Skinner "Universal Unaflow" Steam Engines. Literature describing these engines, and a List of Users, will be sent upon request.

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Cities on the Spo

Police and fire fighte in Los Angeles sue to recov depression pay cuts. Oklahom City firemen ponder strike.

Difficulties with police and fire d partments in two cities were be watched this week by other municipa ties (BW—Apr.29'44,p102)—some them faced with the same latent pro lems.

• **Firemen Lay Off**—In Oklahoma Ci 60 of the city's 204 firemen failed report for work as the scheduled de line for mass resignations by membe of the International Assn. of F Fighters (A.F.L.) passed without threatened complete tie-up of municip fire protection.

In Los Angeles, a suit brought 700 policemen and firemen was pendi against the city to recover approximate $2,000,000 deducted from their salari between 1932 and 1936, at a time wh tax delinquencies caused a shortage city funds.

• **Depression Echo**—The Los Angel suit was significant because it set a pa tern applicable to municipal employe in many other cities which experienc similar shortages of funds during th 1930's.

In the California city, as in ma others, policemen and firemen took 10% pay reduction despite city charte provisions fixing their rate of pay. N adjustment was made in working hou the suit charges.

• **Accounting Sought**—The court acti asks for an accounting of delinquent t money recovered by the municipali since 1936, and for a settlement claims varying from $702 for men the lowest grades to $937.50 for tho with the rank of captain.

The suit asserts that similar situatio have arisen in Milwaukee, Wis.; Om ha, Neb.; Seattle and Bellingha Wash.; and Detroit, Mich.; and th some of these cities have settled wa ers' claims out of court.

• **Dismissals Sustained**—The Oklaho City situation is the outcome of attempt to prevent organization of firemen. Fire Chief G. R. McAlpi last month discharged four men on charge of attempting to organize A.F.L. local in the department. Shor afterward, the local was organized i mally with 106 members, condemn McAlpine's action, and demanded re statement of the four men.

After the matter was taken up by t city council, that group handed the h potato to City Manager C. F. Aura

...o held a hearing and then upheld his ...e chief's action.

Most Remained—The union retali...ed with a threat that since its hands ...re tied by a no-strike pledge, it would ...lize mass resignations unless its full ...mands were met by Nov. 12. How...er, that deadline passed with most of ...e firemen still on the job.

...ewel Reprieve

War-born jewel bearing ...dustry urges U. S. subsidy for ...esearch in an effort to save ...ants from liquidation.

When American troops driving ...rough France reached the Swiss fron...er last summer, the jewel bearing in...stry that was born in the U. S. when ...ports from Switzerland were hard to ...t found itself facing a sudden death. Already WPB has canceled orders ...ith some smaller producers. Now the ...g jewel makers—Hamilton Watch Co., ...gin National, Bulova, and Waltham—...e interested in saving a business that is ...tal to airplane instruments and high ...ecision timepieces.

Research Subsidy Urged—Watchmak...s are asking WPB to persuade some ...vernment agency to subsidize a pilot ...ant with around $200,000 a year to ...idy methods of making jewel bearings ...t costs low enough to make the U. S. ...dependent of foreign imports. Swiss ...wels cost about 5¢, American ones 30¢ ...40¢.

Stockpiles of Swiss jewels in the U. S. ...r civilian watches saved the aircraft ...strument program when war came. ...S. watch companies altered them to ...t. Meanwhile synthetic jewel produc...on was growing (BW—Jul.1'44,p42), ...t difficulties of making the tiny bear...gs remained. A shutdown of these fac...ries and dismissal of the labor trained ...r the job would again make this coun...y wholly dependent on imports.

Presumably what has caused the recent ...rry in the industry is the likelihood ...at U. S. planes may fly jewel bearings ...t of Switzerland. American consump...on in 1943, the peak year, could be ...rried in two DC-3 planes, for the ...tal would weigh less than 9,000 lb.

Elgin Tests Products—Elgin National, ...eanwhile, has several products under ...st to keep its synthetic sapphire ca...city busy at a profit. Already beyond ...e experimental stage with more than ...000 gages now in use by 40-odd war...dustry manufacturers is Elgin's line ...f white-sapphire gages for factory use ...BW—May27'44,p69).

The first sapphire gage made by El-

BYRON-WESTON CO. LINEN RECORD, EXTRA NO. 1 100% DEFIANCE LEDGER 100% WATERFALL LEDGER 75% CENTENNIAL LEDGER 75% WINCHESTER LEDGER 50% BLACKSTONE LEDGER 25% WESTON'S MACHINE POSTING LEDGER AND INDEX 50%

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gin in March, 1943, was a plug-type and-no-go of 0.16-in. diameter. Thi still in use in the company's own pla But it has been used only about 30,(times. Hence it is considered not have proved its durability as yet, e though on work which previously quired replacement of a high-speed st gage after every 800 uses, it shows measurable wear.

• **250 vs. 84,000 Gagings**—The u who reports the most measureme with sapphire gages is Stewart-War Corp. This firm received eight 0.18 0.1885-in. plugs on Dec. 1, 1943, a promptly put these into work gag holes in a forged-steel rocker arm which it was previously averaging 3 gagings from each high-speed steel g before exceeding the 0.0002-in. w allowance. Stewart-Warner has kept record of the number of parts gag with each of these gages. The old has exceeded 110,000 uses; none sho measurable wear.

The same plant is using a sapphi ring gage to check 0.2478-in. dia steel shafts. Steel gages on this j wore out at 250 gagings, but the sa phire gage after having been used 8 000 times is said to have showed a solutely no wear.

Another user is the American P forator Co., which subcontracts t high precision mechanism for punchi holes in teletype sending tape.

In this production one gaging occu immediately after the holes are lappe Consequently, there is usually lappin compound left in the hole, increasi the wear on gages.

Hard steel gages of 0.0721-in. dia eter lasted less than 16 hours. Tungst carbide gages of this size were goo for between 18 and 23 days, but we hard to obtain and deliveries were slo After 210 days' use of sapphire pl gages with daily inspection, not ev five-millionths of wear was detectabl and no scratches showed under hig magnification.

• **More Sizes Coming**—Besides pl and ring gages, Elgin has made pla gages, vee blocks, thread guides f rayon manufacturing, and other indu trial applications of its synthetic sa phire. Its gages sell at prices about trip the price of steel gages that are of com parable quality, and at about double th price of gages that are made of tungst carbide.

Size range of plug gages listed b Elgin runs from 0.040 in. to 0.400 in with larger sizes in prospect. Ri gages come in sizes from 0.004 in. 0.250 in. The maker believes that a large-size gage can be made by insetti sapphire just as tungsten carbide inse are now used, but as yet has not go around to doing it.

Greer Band Oven produces *6000 lbs. of fig bars an hour*

Actually 6,000 lbs. of Fig Bars per hour are being produced by this Automatic Greer Band Oven Baking Unit day in and day out. The bars are formed, baked, cut, cooled, and stacked in rows ready for packing — all done automatically without handling.

The even heat control and uniform bake of the Greer Oven result in a product of improved quality. The Greer method of baking saves a great deal of needless labor, reduces maintenance cost — and is admirably adapted to producing all kinds of crackers and cookies where high quality and high production must be combined. Other important features are low fuel cost and the elimination of scrap.

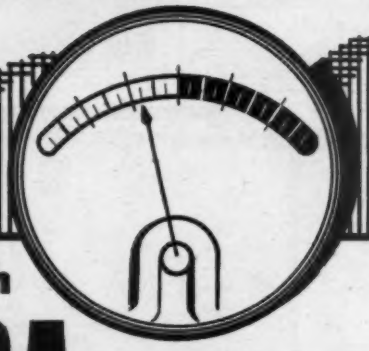
Though Greer is still making a substantial amount of vital equipment for the United States Navy, part of the Greer plant is now again manufacturing confectionery and bakery machinery for customers who are granted proper priorities. Write now for free copy of Booklet W-11 explaining the Greer Band Oven.

J. W. Greer Company,
119 Windsor Street,
Cambridge 39, Mass.

MAKERS OF FAMOUS **GREER** MULTI-TIER CONVEYORS

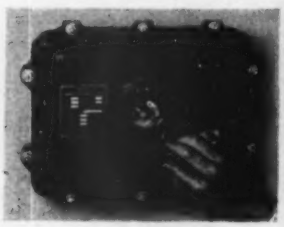
FOR BETTER PLANT SAFETY . . .

KNOW your EXPLOSION hazards



with M·S·A GAS INSTRUMENTS

Precise knowledge of the presence and degree of flammable gas hazards in your operations is afforded by M.S.A. Gas Instruments —available in permanently-installed types for continuous sampling and analysis of atmospheres, (providing instant warning of danger, with automatic process-control if desired), and portable models for on-the-job gas detection and indication. Write for detailed literature on the protection in which you are interested.



Left to Right: M.S.A. Combustible Gas Alarm . . . M.S.A. Explosimeter . . . M.S.A. Combustible Gas Indicator . . . M.S.A. Multiple Sampling Combustible Gas Alarm

MINE SAFETY APPLIANCES CO.
BRADDOCK, THOMAS AND MEADE STREETS
PITTSBURGH 8, PA.

WAR BUSINESS CHECKLIST

A digest of new federa regulations affecting priorities price control, and transportatio

Increased Civilian Supply

A supplemental fourth-quarter allotme of 16,030,000 lb. of copper-base alloy w restore to nearly normal prewar serviceabil such items as safety pins, slide and sn fasteners, scales, underground water an gas service connections, interior worki parts of mechanical pencils. (WPB Orde M-9-c and M-9-c-4, as amended.) Civilian may expect more durable plumbing fixtu and trim items under amendments to Sche ules IV and V, Order L-42. Utilities Orde U-1-d and U-1-f have also been amended t allow more general use of copper tubing fo underground water and gas service lines.

● **Ethyl Alcohol**—WPB has released 2,000 000 gal. of 190-proof ethyl alcohol as a additional allocation for nonbeverage civilia use in the fourth quarter. The extra allo ment will be allocated to alcohol producers who will be authorized to distribute speci fied quantities on certified orders for certain end uses. Products affected by the releas include drugs, food products, cosmetics, ad hesives, photographic materials, brake fluids and others. (Direction 2, Order M-30.)

● **Noncommercial Motor Vehicles**—Appli cations for certificates to buy vehicles to be built in 1945 may now be made to Office of Defense Transportation district offices. Certificates for heavy-duty trucks will ex pire three months after issued, except in areas where 1944 production schedules of desired models are not exhausted; in that case, and for medium trucks, expiration date is Dec. 31, 1944. Applications for light trucks, which will not be produced before February, 1945, will be accepted by district ODT offices beginning Jan. 1.

● **Pencil Sharpeners, File Fasteners**—After a prohibition of nearly two years, manufacturers may use in each quarter iron and steel at the rate of 12½% of the amount of all metals consumed for the same items in 1940. Unrestricted use of iron and steel is permitted to fill military orders. Manufacturers who have no iron and steel quotas for the listed office supplies should apply to WPB in Washington. (Order L-73, as amended.)

● **Galvanized Ware**—Five items have been added to the permitted list under amended WPB Order L-30-a: ash sifters, diaper cans, liquid and dry measures, utility baskets, and watering pots. Restrictions as to size and steel gage on permitted articles have been eliminated. Over-all output will not be increased, however.

● **Cooking Utensils**—While over-all production will not be changed, restrictions on specifications for miscellaneous cooking utensils and on types of iron and steel available have been removed by amendments to Orders L-30-e and L-30-d. Spring-type

"Stopping on a Dime"

is too slow for the War-Time Textile Industry

Zero inertia for reciprocating parts would give the machine designer an ideal condition. No slowing down for the turns. Parts could jump from full speed in one direction to full speed in the other.

Magnesium goes a long way toward providing that kind of equipment. The ring holders shown above, for example, are so light in weight that their direction of travel can instantly be reversed without much worry about inertia. Spinning and twisting machines can be run at higher speeds without setting up excessive vibration. Production is greater, quality higher, machine life longer.

Die cast by American Magnesium Corporation, these parts are light, strong and accurate. They are ready to go to work after a minimum of machining. Fabrication costs are low.

Magnesium is now available to manufacturers of other-than-war products, with W.P.B. approval. American Magnesium is equipped to take care of your requirements for die castings, permanent-mold and sand castings, forgings, extruded shapes and sheet. Our representatives will gladly discuss the availability of magnesium products with you. Aluminum Company of America (Sales Agent for Mazlo Magnesium Products) 1711 Gulf Building, Pittsburgh 19, Pennsylvania.

MAGNESIUM MAZLO PRODUCTS

AMERICAN MAGNESIUM CORPORATION

SUBSIDIARY OF ALUMINUM COMPANY OF AMERICA

YOU
be the judge

Exhibit "A"

INCREASE SHOWN IN BOLD TYP

YEAR	NET	%	VOLUME DO $
1930	46.01	7.80	324
1931	46.98	6.89	359
1932	47.00	7.00	361
1933	50.03	6.79	400

Exhibit "B"

INCREASE SHOWN IN BOLD TYPE

YEAR	NET	$	VOLUME
1930	46.01	7.80	324
1931	46.98	6.89	359
1932	47.00	7.00	361
1933	50.03	6.79	400

Exhibit A is a block of copy composed by typesetting method.

Exhibit B is the same block of copy composed on the *Vari-Typer Composing Machine.*

We think you'll agree that in appearance, neatness and clearness the two are comparable. Yet the Vari-Typer office method of composition costs approximately 50% as much as the other method. For this reason it is the logical way to compose forms, bulletins, parts lists, directories, house organs and hundreds of other kinds of paper work.

As evidence, we wish to point out that thousands of business organizations, including, Mack Truck, G.E., G.M., S.K.F., use Vari-Typer. Reported savings average 50% as compared with former method. In many cases Vari-Typer pays for itself in less than a year--sometimes on a single job.

MAKE THIS TEST:

Send us a one page copy of a form and we'll show you how that page looks when composed on the Vari-Typer. Address your request to:

RALPH C. COXHEAD CORPORATION
333 SIXTH AVENUE - NEW YORK 14, N. Y.

clothespins, curtain rods, fixtures, drapery attachments, and pot scourers are removed from the prohibited list. Production will depend on the availability of raw materials.

Relaxed Restrictions

Industrial instruments for measuring and controlling temperature, pressure, flow, liquid level, relative humidity, specific gravity, acidity, alkalinity, speed, power load or frequency of electric power generating stations have been removed from the controls of Electronic Equipment Limitation Order L-265.

● **Phthalic Alkyd Resins**—As a result of a slightly decreased military demand in November, WPB is now considering requests for alkyd resins for several previously prohibited military and essential civilian items. The latter include motors, transformers, switch gears, etc.

● **Utilities**—Restrictions on purchases of surplus war materials by power, gas, and water utilities have been lifted from Order U-1, as amended, to speed up redistribution to ultimate users.

● **Metal Doors, Frames, and Shutters**—Controls over manufacture and sale have been removed by revocation of WPB Order L-142. Only a small increase in production will result, however, since materials will still be allotted by CMP.

● **Nylon Waste**—Former restrictions limiting the use of nylon waste to the recovery of nylon flake have been relaxed to make the waste available for products ordered by the U. S. Army, Navy, Maritime Commission, War Shipping Administration, or Veterans Administration. (Order M-356, as amended.)

● **Enameled Ware**—While restrictions on types and sizes have been removed from Order L-30-b, WPB cautions that over-all production will not be increased since no additional steel has been allocated for this ware.

● **Industrial Alcohol**—Distillers are no longer required to use a minimum of 10% rye or granular rye flour in fourth-quarter production of industrial alcohol.

Tightened Restrictions

WPB has clarified Order M-84 to prevent sales of binder and baler twine for any use except for mechanical harvesting equipment or in growing, harvesting, or delivery of agricultural crops.

● **Parts for Diesel Electric Locomotives**—Transportation system operators may no longer use the blanket authorization provided under WPB Order P-142 to buy certain repair parts for locomotives of 660 horsepower or larger. To obtain diesel engines, complete truck assemblies, propulsion motors, and generators for repair or reconstruction, operators must apply for a rating on Form WPB 541.

Price Control Changes

OPA has exempted from price control twelve minor items, including toys and games retailing at 10¢ or under; canoes; natural vegetable Christmas decorations and natural vegetable costume jewelry (except wood); shaving equipment made, but not plated, with precious metals; some cartri case trimmers; and other articles. (Amer ment 10, Supplementary Order 45.)

● **Channel Carbon Black**—Defense Suppl Corp. sales of incremental output of c processing carbon black announced recen (BW—Nov.11'44,p53) will be exempt fr price control under Amendment 85 to R vised Supplementary Regulation 1 to G Max.

● **Industrial Wooden Boxes**—By revis Regulation 195, OPA has fixed Oct. 1944, as the end date beyond which sell of boxes used for packaging products oth than perishable fruits and vegetables may n add increased materials costs to their ba prices. In effect, this freezes sellers' pric at their October, 1944, maximum levels.

● **Wood Rosin**—The ceiling for FF woo rosin in carload quantities, f.o.b. plant, a for pale grades of wood rosin has be raised by OPA to $3.50 per 100 lb., a pri somewhat higher than former ceiling (Amendment 187, Revised Supplementa Regulation 14.)

● **Coal Stoker Services**—Provisions fixi specific maximum hourly rates for oil burn maintenance and repair services now i clude similar services for coal stokers wi a capacity of under 1,200 lb. of coal p hr. Higher rates previously established b the regulation will continue if filing requir ments have been met. (2nd Revised Suppl mentary Service Regulation 19 to Revise Regulation 165.)

● **Flooring**—A 2% increase in maximu prices for maple, birch, and beech floorin became effective Nov. 23 in all producin areas except southern, south central, an Appalachian, by Amendment 6, Regulatio 432.

● **Hogs**—Good and choice butcher hog weighing from 200 to 270 lb. will be sup ported at $12.50 (Chicago basis) until Jun 30, 1945. Since Oct. 1, the price sup port has applied only to the 200- to 240-lb hogs. Previous to Oct. 1, hogs weighing 20 to 270 lb. were supported.

● **Sugar**—OPA has established a formula fo pricing new grades of sugar in special pack ages for sales to U. S. procurement agencies When only the packaging is new, prices wil be determined under regulations already i use. (Revised Supplementary Order 34.) A refiner producing new grades or new pack ages for civilians will take his nearest com petitor's price for the identical product, o apply to OPA if no identical grade or packag is put out. (Amendment 13, Revised Price Schedule 60.)

Ration Control Changes

Wider use of ration banking facilitie will be made by local War Price & Ration ing Boards when a new plan for handlin ration currency for five programs become effective Dec. 1. Local boards not served by mailing centers, all mailing centers, di trict offices, and the OPA national office wil open ration bank accounts for the commodi ties included in the ration banking program for which they issue rations. This system has been in use in the gasoline ration pro gram for several months and will now be extended to the fuel oil, shoe, sugar, proc essed foods, and meat-fats programs.

What will your
†† future I.P. be?
This is the Eleventh of a series of advertisements presenting "Industrial Par" and its importance to your company in all future planning. Save this and succeeding I.P. advertisements as the basis for discussion and as a guide to your planning program.

METAL-WORKING STRIDES AHEAD...

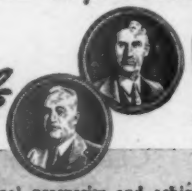
...New Speeds — New Techniques — New Machine Tools Achieve Startling Results That Forecast Trends for the Future.

Production men — busy doing their part in the greatest production effort of all time — can easily overlook or lose sight of significant and startling events taking place on other sectors of the industrial front.

Perhaps you are familiar with the extraordinary developments that have taken place in the world of metals — how harder, stronger, tougher and lighter metals have been created and made available for wide use. Coincident with their development new machine tools have been perfected capable of machining these new metals with record-breaking precision and speed. A new Milwaukee Milling Machine, expressly designed for a new technique of milling, is a representative example of such machine tool progress. Operating at higher speeds, it mills harder, tougher metals to finer, high polish finishes to closer tolerances. Its design and construction is such as to provide the greatest sustained productive power.

In addition to its technical efficiency, the importance of this new Milwaukee Milling Machine is its capacity to increase man-hour output — to increase production and push costs down. For many manufacturers it will prove an important weapon in the coming battle of competitive production — the race to produce better products at lower cost — and to enable them to keep pace with "Industrial Par" as summarized in this advertisement under "Spotlight Facts for your Future I.P. Planning."*

Milwaukee Machine Tools



KEARNEY & TRECKER CORPORATION
MILWAUKEE 14, WISCONSIN

Spotlight facts for your future **I.P.** *planning*

*Production methods — developed in wartime — increase man-hour output; pent-up buying power — released in peacetime — demands increased production.

*The rate of 2½% increase per year output per man-hour, established by a 12 year record of industrial production, can be expected to reach at least 4% per year — compounded.

*Manufacturers must set a goal of 50% increased output per man-hour every 10 years — to maintain a high level of national prosperity and achieve its benefits in terms of security of jobs and wages for the greatest number of workers and the volume production of more goods for more people at lowest cost.

*Machine tools — the most modern, most efficient — are recognized as the most effective implements of mass production and increased output at lowest cost — but only continual replacements with the newest and finest machine tools assure full productive capacity. *Such replacements yearly should be equal to 10% of the total machine tool investment—in keeping with increased output.*

*The cost of machine tools is insignificant in terms of their productive power . . . from 1927 to 1937, according to census reports, American manufacturers had only a total of about 2% invested yearly in machine tools in ratio to a total volume of 9 billion dollars' worth of production annually.

†† **Industrial Par** — *the constantly increasing output per man-hour equal to approximately 50% every 10 years.*

BACK THE ATTACK . . . BUY MORE BONDS

PRODUCTION

Rival for Leather

Many rubber and chemical companies are turning out new shoe sole products. Excellent wearing qualities are claimed.

Competition for the job of soling the nation's shoes is getting tough. The rubber companies, as well as the old-line chemical outfits, are coming out with new and tested sole products that may make leather step lively to keep its first rank in the shoe industry. Research laboratories have released a flood of new materials recently.

• **New Compositions**—Goodyear Tire & Rubber Co. has produced a new composition, "Neolite," of secret formula, neither rubber, plastic, nor fabric.

B. F. Goodrich Co. has introduced shoe soling of its vinyl chloride plastic, Koroseal, for men's, women's, and children's shoes, and in toplifts for women's shoes.

Firestone Tire & Rubber Co. has just announced a new leather-like plastic, "Veloflex." This vinyl base material is to be produced in sheets and coated fabrics in new patterns and designs resembling cowhide, alligator, boxed calf, and pin-point morocco. Fabrication, the maker claims, presents no special manufacturing problems as this material can be sewed, heat-sealed, or cemented.

• **Vinyl Resin Soling**—U. S. Stoneware Co., through its affiliated Chamberlain Engineering Co., is marketing a vinyl resin shoe soling. It expects to modify and adapt its "Tygon" to the purpose.

Du Pont's Neoprene is being similarly fabricated into shoe soles. And the trade expects entries from General Tire & Rubber Co., and U. S. Rubber Co.

The Beaufort Division of the Homasote Co. of Trenton, N. J., has announced addition of two new soles to its line, both being made with vinyl resins.

• **At Chicago Exhibit**—This week Bakelite Corp., the plastics subsidiary of Carbide & Carbon, is exhibiting at the Chicago Shoe Fair a complete line of postwar shoes made with Vinylite soles, heels, and uppers.

Manufacturers' announcements uniformly describe such "shoes of the future" as superior to leather in lightness, flexibility, color-vividness, and wearing quality.

Goodrich said its tests had demonstrated that Koroseal soles would outwear the uppers, even in children's shoes.

• **Insulation Factors**—Goodyear's Neolite was announced at its shoe products division at Windsor, Vt., and described as a rival for leather in providing a firm platform for the foot, moisture-proof and waterproof, giving a high degree of insulation against heat and cold.

Among other advantages claimed for the new products are lessened likelihood of slipping on wet surfaces, and flatness on shoe bottoms for their entire life.

With increased Koroseal production planned for 1945, Goodrich will have other shoe parts available, including uppers, inner linings, and ornamental bows.

• **Colors Possible**—This development will make easy color matching of costumes, with a crackproof "patent-leather" type of finish, and scuffproof tips for children's shoes.

Neolite soles are available in brown as well as black, and may be applied to shoes by any method now in use, sticking as readily as leather.

Goodrich will supply Koroseal soles in all colors, and said that a special ne adhesive, withstanding a pull of 12 lb to 15 lb. per inch, has been develope for fastening them to shoes.

• **Navy Gets Output**—Most of the pr duction of Koroseal has been going t the Navy for fire-resistant electrical in sulation. Before the war it was bein used in belts, suspenders, rainwear shower curtains, and other articles.

Unity in Thread?

Three countries continue quest for standardized screw thread but must first agree on best forms for world use.

The Combined Production & Re sources Board which operates under the joint aegis of the United States, Canada, and the United Kingdom revealed last week that "differing specifications on screw threads and related items among the three countries have already meant an additional $100,000,000 in war production costs and have delayed production and repair of war goods."

• **Report on Standards**—Occasion for the revelation was a meeting for engineers and manufacturers in New York arranged by the American Society of

GLASS FOR COMFORT

Fiberglas blankets that can be snapped into place or quickly removed without tools provide the latest in sound and heat insulation for the Curtiss C-46 Commando transport plane. Designed to make the Army ship easily convertible for troops or cargo, this fireproof layer of glass fibers weighs 200 lb. less than kapok in each installation. The blankets were developed by Owens-Corning Fiberglas Corp., Toledo, Ohio, while the method of snapping them in was evolved by the St. Louis plant of Curtiss-Wright Corp. which is thinking of using them in its CW-20 plane—a projected postwar airliner of which the C-46 is the prototype.

Heart of the Walkie-Talkie . . .

IT looks like a miniature Man from Mars! Actually it's the tube that goes into the famous Walkie-Talkie radios you've read so much about. And it's not much bigger than a large thimble.

The glass for these rugged little tubes is furnished by Corning because Corning has the research and the manufacturing skill to produce them by the millions. Their ancestry goes back all of 65 years, to the time when Thomas A. Edison called upon Corning to make his first successful incandescent lamp bulbs.

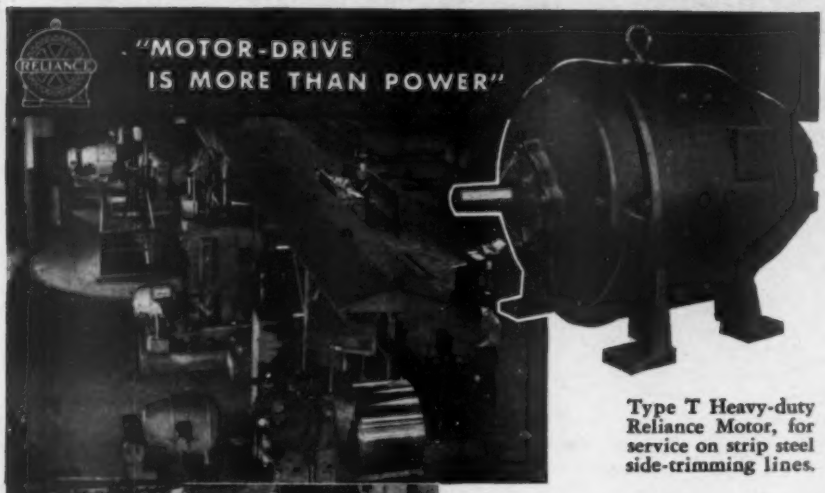
You'll find hundreds of odd, and interesting, and exciting items at Corning today. And you'll find them here because Corning has accumulated a tremendous scientific knowledge of glass coupled to production efficiency, and knows how to use both.

Take the matter of supplying a nation at war with hospital and laboratory glassware. Or new high speed methods for production of optical glass for gunsights. Or the development of a totally new line of unbelievably strong glass tableware for the armed services. Corning has licked these problems and many more! And don't forget where glass has replaced badly needed metals and done a better job, as in piping and glass pumps for highly corrosive acids in chemical and explosives plants.

When the enemy is finished, or as soon as war demands permit, Corning's nearly 100 years of glass experience will again be available to industry . . . to help reduce costs and improve production. Meanwhile, if you are running a war plant and have problems which glass might solve, you are invited to write Corning Glass Works, Dept. 411-B, Corning, N. Y.

CORNING
means
Research in Glass

"MOTOR-DRIVE IS MORE THAN POWER"



Type T Heavy-duty Reliance Motor, for service on strip steel side-trimming lines.

Top, left: Entrance or uncoiler end of side-trimming line where controlled tension through Reliance Motor-drive is an important factor in attaining maximum production.

Left: Exit or recoiler end of line.

TENSION *Constantly Maintained*

FROM ZERO TO 1900 FEET PER MINUTE!

Maintenance of constant tension throughout a wide range of speeds is vitally important, not only in a strip steel side-trimming line as shown here but in processing many other materials. It can be done effectively from a central operator's station by the employment of Reliance Motor-drive.

In this side-trimming line, Reliance Motor-drive permits a full range of linear speeds, from low threading and inspection speeds to a maximum production speed of around 1900 ft. per min. Constant tension is maintained through all speed changes by means of variable-voltage control sets including booster generators which compensate for IR drop and correct for inertia differences during acceleration and deceleration. This is one of many ways in which Reliance Motor-drive can be used for greatly improved results in both quantity and quality of output. It might pay *you* to talk it over with a Reliance application engineer.

RELIANCE ELECTRIC & ENGINEERING CO.
1069 Ivanhoe Road • Cleveland, Ohio

Birmingham • Boston • Buffalo • Chicago • Cincinnati • Detroit • Greenville (S. C.) Houston • Kalamazoo • Los Angeles • Minneapolis • New York • Philadelphia Pittsburgh • Portland (Ore.) • St. Louis • San Francisco • Syracuse • Washington, D.C. and other principal cities

RELIANCE A-C D-C MOTORS

Mechanical Engineers, the Americ Standards Assn., and the Society Automotive Engineers to hear a repo of Anglo-American-Canadian Confe ences on Standardization of Scre Threads & Cylindrical Fits.

The conferees have been working the problem since 1942 with conside able progress in mutual understandi but few results of genuine tangibility.

• **Problem Is Complex**—Basic dive gences in machine screw thread stan ards are the result of general Europea adherence to the Whitworth thre form with its 55-deg. angles and American loyalty to a thread form wi 60-deg. angles and certain other techn cal differences.

Both systems have substantial eng neering reasons for general worldwi adoption, the American having the edg because it can be produced more ec nomically.

• **Research Goes On**—If the proble were simply one of machine screws, would be relatively simple. Real com plexity comes in through diverge standards for pipe threads, electric co duit threads, buttress threads for th breech mechanisms of big guns and ai plane propeller hubs, and several oth types of threading. Standardization, is claimed, would enhance postwar s curity and facilitate export trade.

Spokesmen for the Army, Navy, Civ Aeronautics Board, Maritime Commi sion, State and Commerce departmen are unanimous with similar Canadia and British bodies in the opinion tha the unification of screw thread standard must and will be vigorously pursued.

Meanwhile, further steps await defin tive cooperative research to determin the most practical, if not the bes thread forms for worldwide standar ization, and that takes time.

BOOST FOR ENRICHMENT

Postwar biscuits and baker's brea will continue to be enriched with adde vitamins and minerals if the desires the Millers' National Federation, th American Bakers Assn., and the Asso ciated Retail Bakers of America hav any influence.

Enrichment to restore the vitamin and minerals ordinarily removed fro wheat in milling white flour is now com pulsory under War Food Order No. While bakers are pretty well agreed tha enrichment should be continued afte the war, many are dubious about con tinued federal regulation.

For that reason they are advocatin passage of uniform state laws to cov approximately the same ground a Order No. 1. Such a statute is alread in effect in four states, and has jus been adopted in two others.

Thirty Seconds after Victory

Thirty seconds after Victory the world will be a different place.

Precious lives will then be safe . . . high hopes will replace desperate fears.

Post-war will finally have come. And with it . . . what?

★ ★ ★

As the leader of a great peacetime industry, Carrier promises no miracles. *Except the miracle of air conditioning itself* . . . broadened to touch the daily lives of men and women everywhere.

★ ★ ★

Tomorrow . . . a better Carrier Room Air Conditioner will bring you greater comfort . . . restful sleep through hot, humid summer nights.

But the owner of your favorite store, restaurant or theatre will think of his new Carrier air conditioning as a means of turning hot weather into cool cash.

The manager of your office building will find in the famous Carrier Conduit Weathermaster System a means of attracting more good tenants.

And the manufacturers of a thousand post-war products will prove that air conditioned factories mean not only better and greater output but infinitely happier human relationships.

For air conditioning . . . no longer a luxury . . . has come of age. *In the world of tomorrow no home, no store, no office, no hotel, hospital or factory will be truly modern without air conditioning.*

★ ★ ★

Carrier refrigeration will be ready, too . . . ready with improved, giant centrifugal refrigerating machines for the preservation and storage of food and for hundreds of manufacturing processes. And there will be high-efficiency, smaller refrigeration units for restaurants . . . for food stores . . . for locker plants . . .

Tomorrow will also bring Carrier home freezers of advanced design for city kitchens and farms, better Carrier water coolers for office buildings and industry . . . improved industrial unit heaters for factories, shops and stores.

★ ★ ★

It was Carrier that created air conditioning 42 years ago. Since then thousands of Carrier men and women have made indoor climate their life work.

Out of the Carrier research laboratories, guided by the engineering genius that developed air conditioning and centrifugal refrigeration have come . . . *and will come* . . . products marked by mature craftsmanship and the proven ability to master heat and cold.

Tomorrow Carrier will help bring a new standard of living within the reach and experience of millions . . . and Carrier products will contribute their share to an America that is going forward.

Carrier

AIR CONDITIONING • REFRIGERATION

Carrier Corporation, *Syracuse, N. Y.*

READY FOR MESS CALL

with minutes to spare

When cutting food the Disston curved knives revolve at high speed, passing through a finely slotted comb, making a clean, sheer, draw cut without mashing or squeezing.

Army and Navy chefs know the full meaning of the words, "on time," for they have the tremendous job of preparing three meals a day for several million men! Only with the help of modern mechanical aids is such a gigantic task possible.

In camp kitchens and ship galleys throughout the world —in civil life too—ingenious meat and vegetable cutting machines, equipped with keen-edged Disston knives, are speeding-up meal preparation, reducing costs, and conserving manpower.

This Disston knife, made of one piece of steel, is hardened along the cutting edge only. The remainder of the knife is of comparatively soft steel and, being free from strains and stresses, it does not bend in operation or cause jamming in the comb plates.

Disston engineers are being constantly called upon to provide tools for war and other jobs. Because of Disston experience in producing a wide range of standard tools these engineers have been able to solve some of the toughest problems that came out of the war.

DISSTON

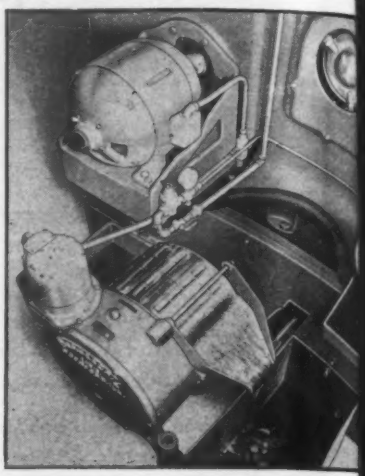
Conserve Man-Minutes and help win the war

When you need wood or metal cutting saws, files, hack saw blades, tool bits or machine knives, you can rely fully on those bearing the honored name of Disston. Write to Henry Disston & Sons, Inc., 1128 Tacony, Philadelphia 35, Pa., U. S. A.

NEW PRODUCTS

Magnetic Coolant Separator

Powerful permanent magnets firmly mounted in the periphery of a rotating drum are the business parts of the new Barnesdrill Magnetic Automatic Coolant Separator, built by the Barnes Drill Co. of Rockford, Ill. Developed primarily to remove "all swarf and magnetic particles" from the coolant used in honing machines, the device is said to work equally well on a grinding machine or almost any other machine tool if a suitable solution is used as a coolant.

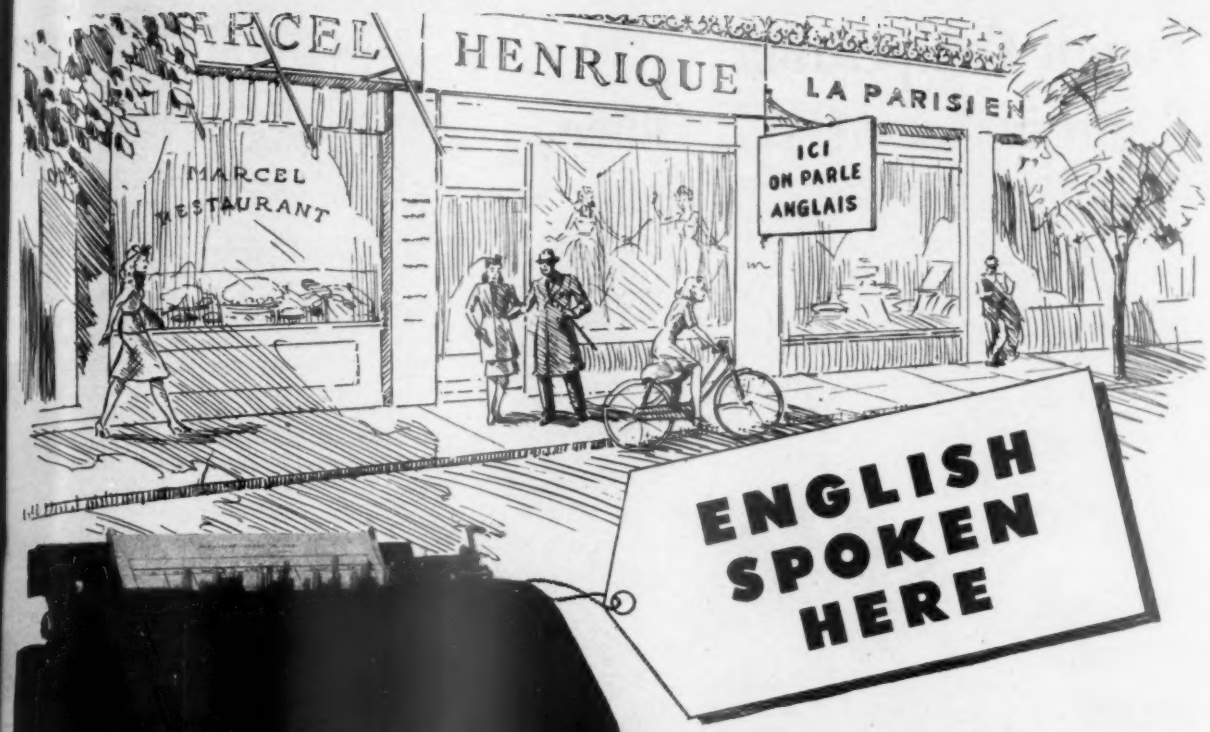


Driven by a ¼-hp. motor (bottom left), the drum rotates slowly in a counter direction to the flow of coolant as it passes underneath. As metal and abrasive particles cluster on the drum's magnets, the entire sludge mass is continuously scraped off and discharged through a chute into a movable pan. The separator comes in two capacities of 10 gal. and 20 gal. a minute. Both utilize the same size of motor.

Electric Fence Tester

No particular unit in the thousands of miles of electric fencing in this country will be worth much in the control of farm animals if current is being drawn off by weeds, broken insulators, or tree branches. For this reason, The Prime Mfg. Co., 1669 S. First St., Milwaukee 4, is bringing out the new Test-Rite Electric Fence Tester.

Business parts consist of a shockproof Lumarith plastic molding about as long as your hand and less than a third as wide, a metal hook to suspend it on a fence wire, and a slender insulated cable connecting with a pointed metal ground to be thrust into the earth. If only one or two of six tiny glow lamps in



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> The first tabulator ever to print totals (1923).
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with a ceiling of Armstrong's Cushiontone

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the molding light up when connection is made, the test indicates that current is coming through all right but not in sufficient volume to shock an animal. If five lamps light up, the fence is in good condition. The sixth lamp comes into play when a fence controller is under test.

Seam Sealer

Presstico Spot Weld Sealer, new product of Presstite Engineering Co., 39 Chouteau Ave., St. Louis 10, is being formulated in three types for application by brush, spray, or flow gun. Purpose of the compound is to fill in the gaps between spot welds in the seams of metal boxes and other weldings that should be liquid-tight.

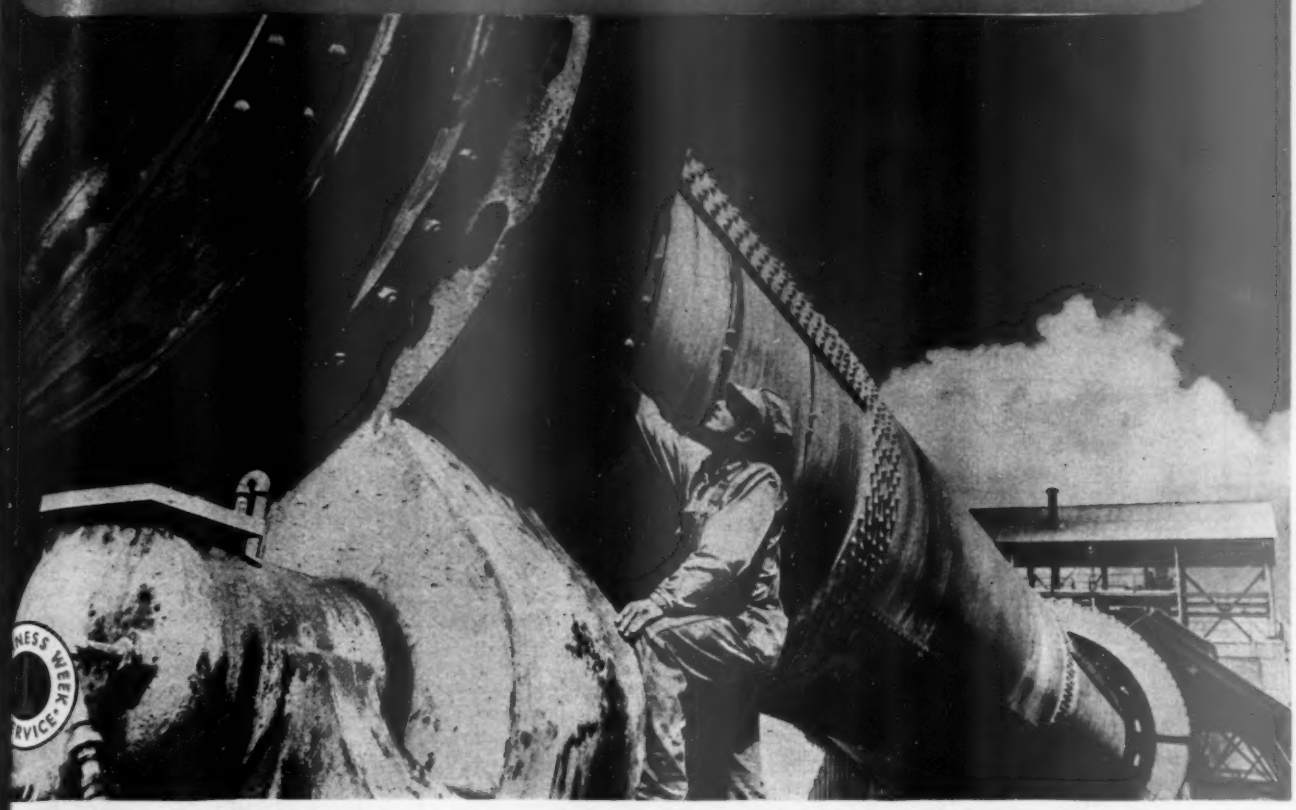
It is claimed that the material has "high resistance to dilute acids, alkalis, and mineral oils," exhibits "no corrosive effects on metals," and stands up "satisfactorily" after undergoing a salt spray test that lasted two weeks. Boxes sealed therewith can be Bonderized and painted as though it were not present in their seams.

THINGS TO COME

On any fine and fairly windless day of the not-too-distant future, the well-equipped merchant will lower one or more of his display windows bodily to street level. The store, which will become its own display, will thus be provided with extra entrances for customers at the window openings. How the merchant will control the operation of his new sales assisters will depend upon the type of lowering and raising equipment selected—by valves for a pneumatic or hydraulic installation, by buttons or switches for electric.

Winter Monday mornings in postwar homes will be just as warm as any other week-day morning if their heating equipment includes a recently designed thermostat timer that can be set for a whole week's heating schedule in advance. No longer will it be of any consequence if a householder forgets to reset the thermostat Sunday evening after having previously changed the instrument to save fuel pending a luxuriously late rising on Sunday morning. If so desired, the heating schedule can be different for every day in the week since the timer can be set for any "off" and "on" arrangement.

WHAT'S COMING IN CHEMICALS



To prepare management for the postwar impact of chemistry on business.

In the belief that the highly trained chemist is pure science in human form, his well-meaning publicists have given him a halo for a hatband. They enlarge it frequently. Here is a man who makes rubber from alcohol or crude oil, who converts wood pulp into rayon and coal into nylon; a man who precipitates magnesium from sea water, and creates plastics from the atmosphere.

• **Planned "Miracles"**—Not having created this halo himself, the chemist seldom notices it, or bothers to take it off. His language frequently bewilders the unscientific ear, and the listener may conceal his bewilderment by referring to each new achievement of chemistry as a miracle.

There are no miracles in chemistry. There have been great discoveries, usually the result of systematic research. There will be others, because, as every chemist knows, the practitioners of this science, with all their diligence, have caught only a few facts out of an ocean of possibilities.

• **Demand Is the Stimulus**—Chemical discoveries seldom strike humanity like a bolt of lightning. They are more likely to come along slowly, falteringly, and it is almost a general rule that each new development answers some human demand strong enough to create a market.

Demand today will not always produce a great chemical discovery tomorrow. But if the demand is strong enough, the chemists will get to work and try to satisfy it.

• **Unfinished Business**—The unsatisfied demands constitute for the chemist a pretty impressive mountain of unfinished business. Steel makers, for example, have to use 15 lb. of manganese to produce each ton of steel; because there seems to be no domestic source of manganese they can depend on, they'd like to have a replacement material.

Contractors and builders want cheaper and better materials. Medical men want specifics for the common cold, for cancer, tuberculosis, infantile paralysis, influenza, and, perhaps most important, they want to know more about the chemistry of human deterioration in old age.

• **Broad Range**—The public wants to stop the pollution of its waterways and its atmosphere; it wants to rid its surroundings of flies, mosquitoes, and vermin; it wants to get the moths out of its furniture, and the fleas out of its children's pets.

If the past is a key to the future, chemists will find the answer to some of these prayers, and to many others not yet articulated. In a good many cases it has become literally true that synthetics can be tailored from the ground up to meet a specification. The limits are the strength of demand, and the existing state of chemical intelligence.

This report, for the information of

Chemistry's New Research Tool

The electron mircroscope, which is opening up a new world of visible substance, is a new and important tool of chemical manufacturing. The way it brings submicroscopic territory into focus involves the scientists' explanation of visibility. The eye "sees" an object if that object interrupts light waves. The wavelength of light in the visible range is said to be 0.0004 to 0.0008 of a millimeter. The average human eye cannot distinguish between or "resolve" two dots on a piece of paper unless they are at least 0.2 of a millimeter apart.

• **Seeing by Electron Waves**—Electron waves, at the speed used in the electron microscope, are only 1/100,000 the length of visible light waves, and they can be directed through doughnut-like magnetic or electrostatic fields, exactly as light rays can be directed through a lens.

Extremely small objects, such as the fuzz on a mosquito's wing, or the particles in smoke, become visible when the electronic waves interrupted by those objects reflect a pattern on a fluorescent screen, or a photographic plate, if desired.

• **Here's How Small**—The objects brought into eyesight range by the electron microscope are measured in units so small that they are difficult to imagine. Stretch your imagination downward one step at a time. Start with a millimeter. That's about 0.04 of an inch. A millimeter equals 1,000 microns. But the micron is still too big for measurements in the electron microscope's diminutive field of vision. It uses an arbitrary designation, named for a Swedish scientist, the Angstrom unit. One micron equals 10,000 Angstrom units.

Taking it another way, the average human eye can resolve detail no smaller than 2,000,000 Angstrom units. The electron microscope is said to have a maximum resolution of 20 Angstrom units. This means that the maximum useful magnification of the electron microscope is 100,000 diameters. Any magnification beyond that, entirely possible through photographic enlargement, doesn't add any detail, but only makes a bigger picture. In practical operation, the electron microscope's limit is 35 to 50 Angstrom units.

• **First Model for Chemicals**—It was expected, when the electron microscope first came out as a commercial product late in 1940, that its principal usefulness would be in exploring the private lives of death-dealing bacteria. But the first model was sold to a chemical manufacturer. About 100 have been sold since, and half of them are working at chemistry, in research, raw material and product analysis, process control, and other jobs where their powers of observation come in handy.

A slow, painful development, the electron microscope was germinated in the discovery of the electron in England 47 years ago, by Sir Joseph John Thomson. Later a Bell Telephone group of research men including Clinton J. Davison, Lester Germer, and G. P. Thomson, Sir Joseph's son, demonstrated that electron waves behaved like light waves. In 1926, Prof. Hans Busch, a German, reduced electron optics to a systematic science, and within a dozen years afterward, independently produced electron microscopes had appeared in Berlin, and Brussels, and at the University of Toronto.

In this country Radio Corp. of America first made the instrument into a commercial product on the heels of development work by Vladimir K. Zworykin (seated in front of the instrument in the photograph), James Hillier, and Arthur W. Vance. General Electric has developed its own compact commercial models, and Westinghouse, now working on experimental variations, is getting ready to bid for a share of the market.

business management, traces some of the significant trend-lines and describes some of the representative achievements that measure the impact of the chemist on the businesses of individual readers and on the world of today and tomorrow.

I. NEW HORIZONS

Significant for industrial civilization, and immediately significant for chemicals, are scientific discoveries that have begun to push back the old horizons of visibility, speed, and flying altitude.

Visibility is being extended by electron devices which bring out the structural details of matter that are hidden from even the most powerful light microscope. Speed and altitude are being extended by new reaction motors, including both rocket and jet propulsion types.

• **Barrier-Breakers**—These remarkable discoveries no longer are any secret to the scientists, but both groups are too new to have been fully explored or generally appreciated. Both are in the realm of physics. They help explain predictions to the effect that the age of chemistry will yield to the age of "functional engineering," in which barriers between the technologies will be broken down, and the discoveries of all mobilized for the benefit of ultimate consumers.

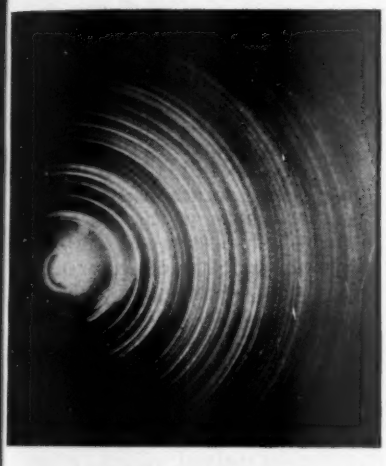
For the immediate future, the chemist will be the chief beneficiary of electronic observation. He has a new set of research tools, promising more exact knowledge and deeper understanding of the nature of all substance.

• **Dream Coming True**—The electron microscope, which, at its present stage of development, can magnify tiny flecks of matter a limit of 100,000 times, is a step toward the scientist's dream of making molecules and atoms visible. The best electron micrographs are said to approach the goal of making molecules visible, but atoms continue to be out of range, although theoretically it would be possible to bring them into view by refinement of the electron microscope method.

• **Data From Light Rings**—Another mechanism developed in recent years, X-ray diffraction, is a technique of analysis by light rings. Each material subjected to X-ray diffraction shows up its own peculiar pattern of light rings. The data obtainable from these light rings can be reproduced photographically, according to Eastman Kodak Co., which credits the method to Sir Lawrence Bragg, "using an effective magnification of 100,000,000 diameters," but not direct visual magnification.

The mass spectrometer records diffrac-

Electronic observation has vastly expanded the chemist's field of vision. Above, zinc oxide smoke particles as seen through an electron microscope. Below, zinc oxide light-ring pattern obtained by X-ray diffraction.



tion patterns in chart form by means of equipment which, Westinghouse reports, has been specially useful in controlling processes in government rubber plants. It produces in 15 minutes data which might otherwise require from 15 hours' to three days' laboratory work by half a dozen chemists. Furthermore, the mass spectrometer method of analysis is claimed to have proved "much more accurate."

• **Guides to Change**—More exact knowledge of chemical structures, through electronic observation, opens up infinite possibilities for the chemist to change a material to meet a need. For example, Robert D. Heidenrich of Dow Chemical Co. told the Optical Society of America recently that three-dimensional observation of metal crystals through the electron microscope and Vectograph, "as one can examine the formation of rock in a quarry," is helping to develop new and better alloys.

To aid in technical control of the widely scattered production of government rubber and its components, the top government chemists acquired an electron microscope for official use long before the new plants began to operate. It went to work anonymously and secretly, and it's still working at the same job.

• **Motors for Tomorrow**—The part chemistry will play in the development of reaction motors, and vice versa, is not yet plain, except for the obvious fact that rocket propulsion (BW—Nov.4'44, p17) requires some kind of chemical fuel. However, fuel, at this stage, is no special problem; the designers have more speed than they can handle with fuels already known and available.

The exciting thing about reaction motors, according to those who have been in touch with their development, is that they begin to become truly efficient at about the airspeed of sound—that is, at about 740 miles an hour—which, today, appears to be a practical limit for propeller-driven aircraft.

• **Challenge to Chemists**—Discoveries included in the term, reaction motors, now belong to the military. They include two general classifications: self-contained or rocket motors, which carry their own oxygen, usually in a chemical combination, and airstream motors, which take oxygen from the air.

Both types offer the chemist a challenge: to develop engine construction materials able to withstand the terrific heat generated by engines designed for supersonic speeds. As soon as the designers get such materials, they'll be all set to give speed and altitude another big push.

II. CHEMICAL ENGINEERING

If the chemist is the cook who dreams up and tries out new recipes for all kinds of new substances, the chemical engineer is the mechanic who designs the kitchen equipment that puts the recipes into commercial production. He is not peculiar to America, but he has achieved his highest peak of usefulness here, where mass production techniques, mass prosperity, and plentiful raw materials provide a solid foundation for his labor.

• **Rubber the Headliner**—Mass production of synthetic rubber within two years after Pearl Harbor can be considered the outstanding chemical engineering achievement of this war.

Such an achievement would have been impossible without strong measures. The government took them. It

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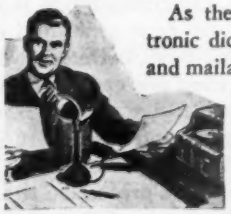

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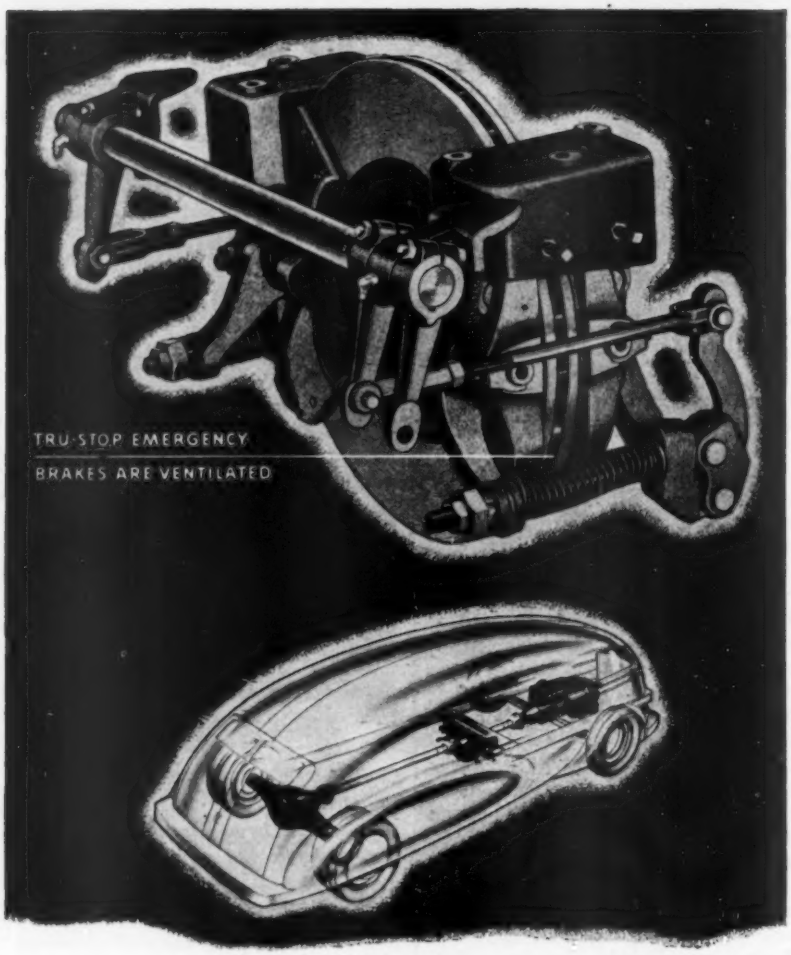

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financed a $700,000,000 building program, said to equal 70% of the prewar capital stock of all American chemical manufacturers, it abrogated free competition in favor of a central patent pool in which all producers joined, it got top priorities on all construction needs, and it drafted the services of the best technical minds available.

• **Weeks Instead of Years**—Processes for making various kinds of synthetic rubber were fairly common knowledge among industrial chemists several years before the war. The synthetic rubber achievement of contemporary history was in getting commercially useful synthetics, from widely separated plants having gross annual capacity of more than 800,000 tons, without the customary interlude of two, three, or a dozen years spent in laboratory pilot plant, small pilot plant, and large pilot plant tryouts. This was an audacious, brilliant job of chemical engineering.

Quick decisions had to be made under the threat that, unless rubber production could be achieved quickly, the U. S. war machine and home-front transportation would break down. Arguments once quashed by these decisions may be revived in competitive peacetime production.

• **Making a Choice**—One decision, for reasons unpublicized at the time, turned thumbs down on neoprene as the principal tire rubber, on the ground that it would be too costly in terms of electric power needed for other war industry requirements. Neoprene, a du Pont discovery based on acetylene gas, the product of electric furnace reduction of lime and coke, had been in commercial production since 1932, although in much smaller volume than was needed quickly for tire rubber. In physical properties, it resembles natural rubber, although chemically it is more resistant to deterioration by sunlight, ozone, and oils.

Chosen as the big tonnage rubber was a development of what the Germans called Buna-S. It was renamed "Government Rubber, Type S," usually abbreviated to "GR-S." Patents on its polymerization (a kind of chemical welding) were bought from the German Dye Trust in 1929 by Standard Oil Co. (N. J.). Principal intermediates for its production are the chemicals, butadiene and styrene.

• **Race for Butadiene**—Dow Chemical Co. had a going styrene process. The big problem was butadiene. Butadiene tonnage had to be three times that of styrene and it was still a kind of laboratory curiosity. Carbide & Carbon Chemicals Corp. was willing to risk its reputation on a butadiene-from-alcohol process. Consequently, alcohol butadiene

got the first green light, and Carbide's confidence was justified in successful mass production. More recently, petroleum butadiene plants have gone "on stream," which means they have begun continuous production.

Petroleum butadiene plants seem to have a cost advantage over the alcohol units, exaggerated for a time by the necessity of using expensive grain alcohol rather than alcohol from byproduct blackstrap molasses. However, it is pointed out that the alcohol process can just as well use low-cost alcohol synthesized from petroleum.

• **Tires and Tubes**—What might have happened to the main part of the rubber program, through accidents or lack of experience, did happen to Butyl rubber. This Standard-developed synthetic, not part of the government program, is specially useful for inner tubes because it's virtually nonporous. It suffered acute growing pains in the form of technical and mechanical troubles up to late 1944.

Government rubber has been meeting its production schedules, but it hasn't yet proved as satisfactory for tire-making as natural rubber. Chemists say it will, eventually. The history of synthetics is that they tend to be more uniform than the natural product, and more easily modified to suit requirements. Also, their prices tend to be comparatively steady and to maintain a downward curve as production increases.

• **Recent Advances**—Recent technical progress is encouraging. The continuous (instead of batch) polymerization of GR-S, which the rubber manufacturers couldn't get government chemists to approve at the start, has been installed by Goodyear. Difficulties in working GR-S are said to be minimized by the addition of new emulsifying agents. Goodrich reports manufacturing one of these in a volume of 2,750,000 lb. monthly; it claims to have achieved both softness and tackiness in new modifications of GR-S.

General Tire & Rubber Co. and Firestone have new time-saving techniques of adding carbon black directly to synthetic latex in the liquid stage of processing, rather than milling it into the dry product. U. S. Rubber Co., one of the largest producers of rubber-compounding chemicals, has been consistently optimistic over road performance tests of its synthetics. Hycar Chemical Co., a joint venture of Goodrich and Phillips Petroleum Co., claims there are hundreds of virtually untouched applications for its oil-resistant type of synthetic.

• **Plans for Butyl**—Standard Oil Co. hasn't said so, but its Butyl rubber is

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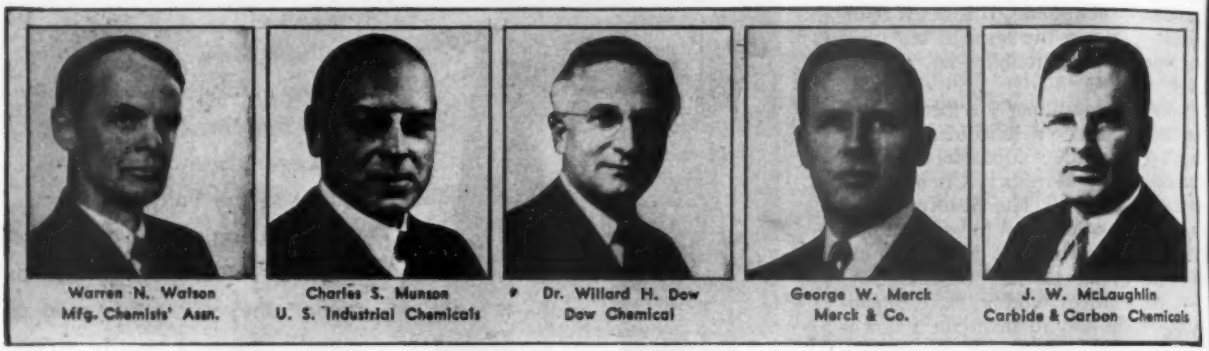
Dr. D. P. Morgan, WPB Chemicals Bureau | H. L. Derby, Amer. Cyanamid & Chemical | Charles Belknap, Monsanto Chemical | E. M. Allen, Mathieson Alkali Works | Lammot du Pont, E. I. du Pont de Nemours

These ten men belong to the high command of the chemical industry's war effort. Dr. Morgan, a consulting chemist with Scudder, Stevens & Clark, investment counselors, until he entered government service in 1940, directs the WPB Chemicals Bureau. Derby is chairman of the Chemical Advisory Committee of the Army & Navy Munitions Board; the others are members of that committee. Not pictured here is a tenth member, H. F. Atherton, president of Allied Chemical & Dye Corp. Watson, association secretary, is committee secretary, too.



Warren N. Watson, Mfg. Chemists' Assn. | Charles S. Munson, U. S. Industrial Chemicals | Dr. Willard H. Dow, Dow Chemical | George W. Merck, Merck & Co. | J. W. McLaughlin, Carbide & Carbon Chemicals

expected to sell after the war at a price to compete with GR-S or its modifications. Butyl applications will include waterproof packaging film.

When Standard got the beginnings of Butyl in patent rights on German Vistanex (polyisobutylene) in a deal which also included Buna patents and synthetic toluol, the Germans assured Standard technical men that it was impossible to vulcanize Vistanex into a satisfactory rubber substitute. That word, "impossible," always stimulates a research man to put his heart into a job.

• **Postwar Problems**—Currently, it is considered "impossible" to produce the new synthetics cheaply enough to compete directly with natural rubber, which in the past has demonstrated that it can come into this country, at a profit, bearing a tidewater delivered price of 10¢ to 15¢ a pound. The research men say that "impossible" may last another two years.

Meanwhile, the producers want some kind of government protection. One kind suggested is continued government ownership of synthetic plants with rental adjustments to compensate private lessees for any loss incurred in meeting the price competition of imported natural rubber. Another suggestion is modification of the antitrust laws so as to permit organization of a government buying pool, to purchase synthetics at prices that would cover production costs, and thereby keep the new industry alive.

III. SYNTHETICS FROM OIL

The oil companies are proud papas of a chemical engineering achievement of their own. Like government rubber, 100-octane gasoline and superoctane gasoline are synthetic (built-up) chemical products, whose mass production is a triumph of chemical engineering.

And the petroleum chemists, like the rubber chemists, plan to intensify their research efforts as soon as they can get the manpower. For example, Robert P. Russell, president of Standard Oil Development Co., the research subsidiary of Jersey Standard, has said that his company would like to double its present staff of research workers because it has "used up the fat" from its prewar research. Its wartime payroll numbers about 2,000.

• **No "Impossibles"**—Although the super-super aviation fuel component, triptane (BW—Sep.23'44,p76), represents the all-time peak in fuel for the conventional aircraft engine, chemists avoid saying that a better fuel is "impossible." They also avoid offhand opinions on the easy conclusion that reaction motors will not require highly specialized fuel.

These chemists have made a long technical climb from the days when crude oil was "fractionated" simply by boiling off its various natural components, or "fractions," at various boiling-point temperatures. Separation now is effected, and new fractions created, by chemical processes.

• **Raw Materials**—The resulting chemical products are the raw materials from which may be synthesized hundreds and thousands of finished products and intermediates, solvents, plastics, cleaning preparations, adhesives, resins, medicinals, alcohols, synthetic rubber, and synthetic fuels that can be tailored to fit the requirements of any type of engine.

The quantity production of many of these chemical products for the first time, and their new standards of purity, suggests G. G. Oberfell, research vice-president of Phillips Petroleum Co., are significant for the future of all manu-

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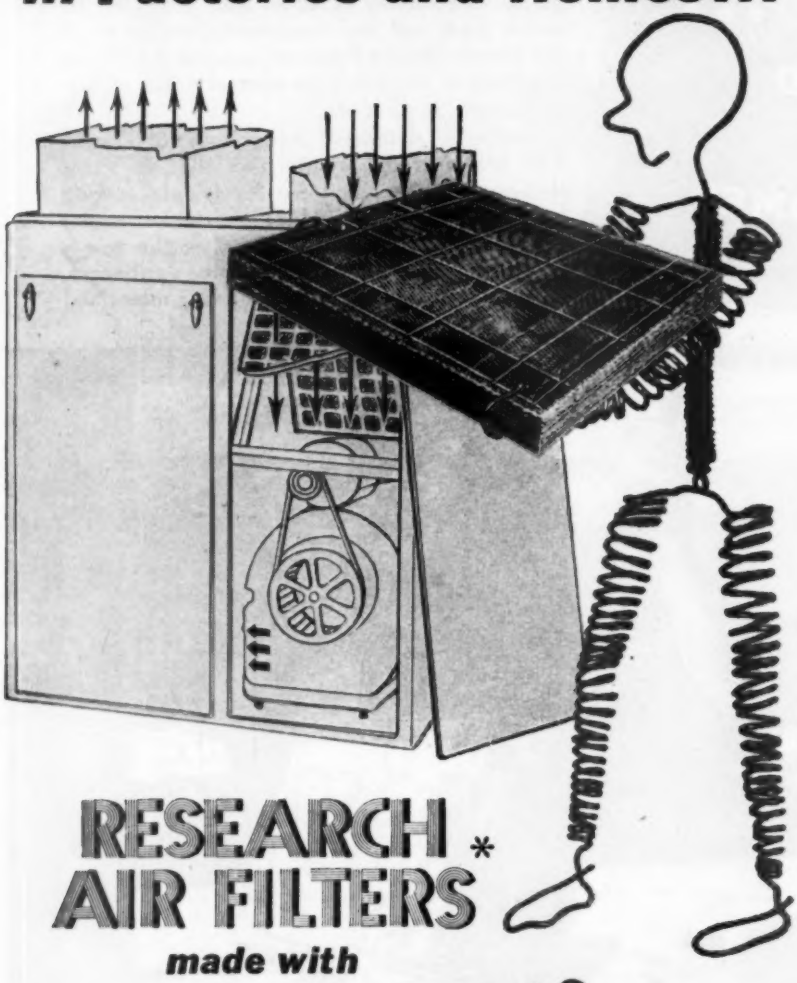

RESEARCH* AIR FILTERS
made with
KEYSTONE Wire

Research Air Filters, the grids of which are made from Keystone wire, are helping guard the health of millions in war plants, factories, office buildings, theatres and homes. These efficient, economical filters remove more than 90% of all dust, dirt and lint from the air. Result . . . lung infections and diseases are greatly reduced . . . manufacturing processes are improved.

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Special Analysis Wire for All Industrial Uses

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facturing. So are the lower prices made possible by large-scale production.

• **Price Lessons**—Butadiene, for example, was a laboratory material a few years ago; today, its annual production rate has climbed to 600,000 tons, and costs are, in some instances, reported as low as 10¢ a pound and still going down. Styrene used to be 50¢ a pound; it has dropped to 15¢.

Petroleum is a convenient well from which the chemist can draw buckets full of new products, but it's not the only one. The same fuels, lubricants, and other hydrocarbon chemicals that can be extracted from crude oil can also be extracted from natural gas, from coal, or from oil shale.

• **—And History Lessons**—This has been true in theory since a group of German chemists, including Freidrich Bergius and Emil Fischer, discovered how to deal with mixtures of hydrogen gas and organic materials like coal, under controlled conditions of heat and pressure, and thus produce oil and its derivatives synthetically.

That discovery dates back more than 30 years. From it the Germans have developed the synthetic gasoline which powers much of their war machine, and synthetic lubricating oils.

Another discovery of this same period was a process to capture nitrogen out of the air and fix it in the chemical compound, ammonia. This discovery released Germany from dependence on foreign nitrates during the first World War.

• **Broadening the Base**—Although synthetic fuel was discovered more than 30 years ago, the possibility of liquid fuel from nonpetroleum sources wasn't considered seriously by American industrialists until the last year or so, when unprecedented demands sharpened the suggestion that, ultimately, they may be forced to broaden the base of their raw materials.

The U. S. produces more than half the world's present oil supply, but geologists say we probably have only about 15% of the world's underground petroleum reserves. So eventually, in 10, 15, or perhaps 100 years, we may have to look outside this country's oil wells for our fuel and lubricants.

• **Reserves for the Future**—In view of assurances that our natural gas and shale oil supplies ought to be good for at least 100 years or so, and our coal reserves for at least 3,000 years, the prospect isn't too depressing. While many industrial chemists insist that alcohol from farm crops would be too expensive for fuel as long as we have these other resources, the cost advantages that petroleum has held over two of its

alternatives, natural gas and coal, are being gradually whittled away.

Competitive chemical developments in this country plus information from abroad have "already shown us how to make unlimited quantities of gasoline from coal," according to Robert E. Wilson, chemical engineer and chairman of Standard Oil Co. of Indiana, and he adds that prices, "if allowed to follow the natural course, will almost certainly reduce the costs of gasoline made from coal to a figure not over 5¢ a gallon above present gasoline costs.

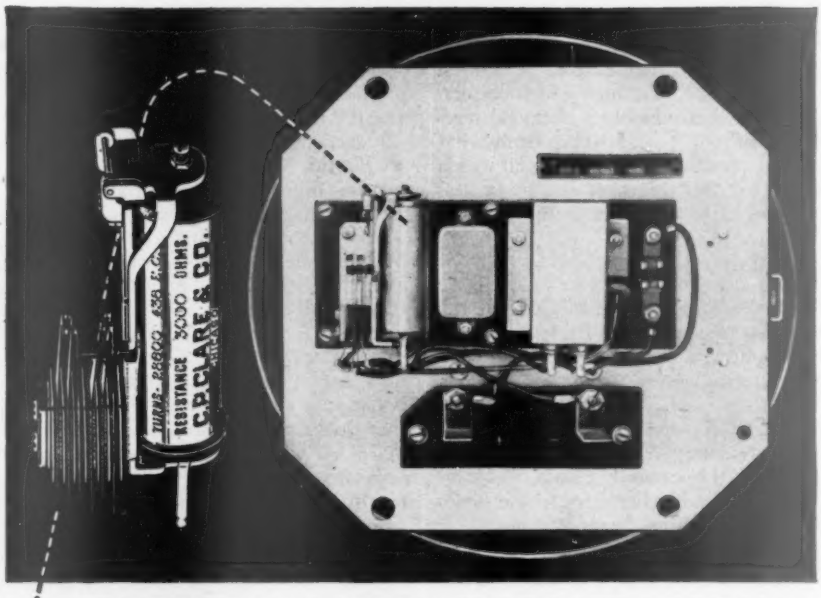
• **Liquid Fuel From Gas**—And even before gasoline from coal is a commercial reality in this country, it seems likely that liquid fuel will be produced synthetically from natural gas for the American motorist. The processes for doing it are ready. One requirement, of course, is a low-cost gas supply, usually defined as less than 5¢ per 1,000 cu. ft., and the chemists note that quantities of oil field gas continue to go to waste for lack of nearby markets or pipelines.

All this constitutes plain evidence that chemistry has advanced to the point where it can pick and choose its sources of hydrocarbons for synthetics on the basis of cost and physical availability. It is not tied down to any one.

• **New Chemical Tools**—On the basis of present economics, the major sources will be petroleum, natural gas, and coal. From them, and without advancing beyond present chemical knowledge, can be produced motor gasoline promising the light car owner 40 miles to the gallon, a gasoline additive so effective that less than half an ounce inhibits gum formation in a 100-gal. lot; component of low-freezing dynamites (ethylene glycol dinitrate) which increases their usefulness in cold weather and proved invaluable in building the Alaska Highway; an additive for concrete (triethanolamine) which promotes quick setting, increases workability, and adds strength; glycols for the sealed cooling systems of future motor cars; a versatile substance (diethylene glycol) which acts as a fireproofing agent in molding sand for magnesium foundries, as a solvent for dyes, and as a moistening agent or humectant in some brands of cigarettes. And there are other glycols for hydraulic systems, to help make casein glue, and to help process cork, paper products, and textiles.

The list of known, useful chemicals from petroleum, natural gas, and coal could be extended indefinitely, including thousands that have been isolated but not yet investigated conclusively.

• **Unanswered Questions**—But there's also an ocean of undiscovered facts in hydrocarbon chemistry. How, for ex-



120 STROKES OF AN ELECTRIC RAILWAY GONG PER MINUTE

TWO EVERY SECOND

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Mounted underneath the cars, where dust, dampness and vibrations are ever-present, a Clare "Custom-Built" Type "C" Relay controls the action of a solenoid plunger to give a continuous ringing effect as long as the circuit is held closed. The operating mechanism and the gong are mounted on the box cover as shown.

Electric Service Manufacturing Company, like hundreds of other concerns, chose Clare "Custom-Built" Relays for this exacting installation because they found in Clare "custom-building" the flexibility to give just the relay best fitted for the job.

This unusual ability of Clare to supply the relay for the unusual application . . . where ordinary relays won't do . . . comes from the fact that Clare "custom-building" offers the designer a wide choice of mountings, contact ratings, contact forms, coil windings, closure sequences and pressures. Every detail can be adapted exactly to a specific design.

Clare "Custom-Built" Relays are well known for their manufacture from the finest materials . . . for their precise adjustment and dependable operation. Whatever your design or production problem, it will pay you to know all about Clare "Custom-Built" Relays . . . what they can mean to you in higher efficiency and reduced relay costs.

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"CUSTOM-BUILT" Multiple Contact Relays for Electrical, Electronic and Industrial Use

ample, does a catalyst work? A catalyst is defined as a substance which accelerates or makes possible a chemical reaction, without participating (somewhat like the parson at a wedding), and which later may be recovered, more or less unchanged by the terrific things it has done.

Without knowing how a catalyst works, chemists have, nevertheless, gone far in learning what catalysts will do. By using catalysts—such things as refined clays, silica gel, aluminum chloride, sulphuric and hydrofluoric acids—and by perfecting mechanical equipment, the petroleum chemist has been finding new worlds to conquer. He may conquer still others if the catalyst should yield up the secrets of its chemistry to the penetration of electron beams.

IV. SEARCH FOR INSULATORS

Radar, another trophy of exploration among the electrons, behaves better if protected by adequate insulation. The chemist comes in there, too, to play an important part in the recent advances in radar, radio, and television.

• **A New Family**—Search for new insulating materials by Dr. Frank Hyde and Dr. E. C. Sullivan of Corning Glass Works, aided by Dr. R. R. McGregor of Mellon Institute, culminated in commercial production this year of a new family of materials called silicones, by Dow Corning Corp.

Pioneering in silica carbon chemistry was done by F. S. Kipping, a British chemist, who concluded, after many years of research, that commercialization of his work was impossible. Now, the possibilities are compared with the achievements in hydrocarbon chemistry.

• **"Plastic Merger"**—Silica is sand, or quartz. Silicon, the metallic element which combines with oxygen to make silica, is, next to oxygen, the most plentiful element in the earth's crust, about 29% of all the material available to man.

The silicones, in a sense, combine mineral and organic plastics. They fill in the previously unexplored territory between glass, a mineral plastic, and the hydrocarbon compounds which make organic plastics. Processed into resins and bonded with spun glass, asbestos, or mica, they produce an insulating material almost indestructible by heat.

• **Also Greases**—In other forms, silicones produce liquids and greases with boiling points up to 392F, some which remain fluid at temperatures down to −158F. Low-temperature greases are specially useful in stratosphere flying. And because silicone greases are not affected by the commonly used active chemicals, they make good valve lubricants in chemical plants.

In electric motors, silicone-bonded insulation is said to permit trebling of horsepower rating without increasing size. In transformers, such insulation is said to eliminate the need for a water-cooling unit.

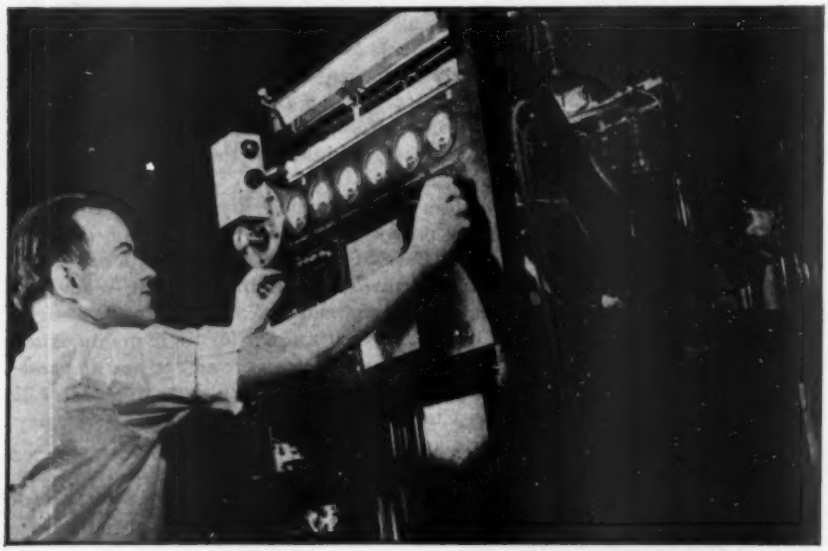
• **Silicone Rubber**—Recently General Electric Co. disclosed that it has been exploring silicone chemistry, particularly that it has developed a rubber-like substance in which silicon atoms take the place of carbon. The result is a gasket material, specially useful in high-power search-lights and in bomber superchargers. According to Dr. A. Lincoln Marshall, in charge of the chemical section of the G.E. laboratory at Schenectady, N. Y., silicone rubber resists temperatures above 300F, whereas natural and many synthetic rubbers deteriorate rapidly at 212F, the boiling point of water.

At its present stage of development silicone rubber is high in cost—about ten times that of other synthetics—and low in tensile strength. But the G.E. chemists hope to change both. They've already advanced silicone rubber to the pilot plant stage at Schenectady.

• **Air Radio Aid**—An entirely different kind of material, colloidal graphite, has been another chemical contribution to electronics. Aircraft radio sets, according to Acheson Colloids Corp., will work more quietly and efficiently if the grids and plates of the tubes are treated with this product.

A new resin plasticizer said to keep cable lacquers, wire enamels, and vinyl resin fabric coatings flexible in subfreezing temperature has been developed by Resinous Products & Chemicals Co.

• **Applied to Bearings**—A group of laminated phenolic plastics including Micarta (Westinghouse) and Textolite (General Electric) originally were developed for insulation materials. Now they're also used for airplane wing-gun ammunition feeds, interliners for steel helmets, bomb racks, and bearings. A 50-lb. Micarta bearing, for example, is said to carry 1,000,000 lb. on a steel mill rotating roll, and to have a rolling life of 450,000 product tons. Laminated phenolic propeller shaft bearings seem to enjoy salt water, which acts as a lubricant for this plastic, but corrodes metal bearings.



The electronic device called a mass spectrometer is a kind of mechanical chemist. Within a few minutes it can complete a chemical analysis which, if done with the usual laboratory apparatus, would require several hours.

V. FOOD PRODUCTION

The farmer buys chemicals by the ton in the form of commercial fertilizers. He buys in smaller quantities but at higher unit prices when he invests in fly spray, orchard spray, and medicines for his livestock.

• **Farmless Farming**—With chemicals, it's even possible to be a farmer without a farm. On a commercial scale, this is done by getting a concrete basin, perhaps a foot deep, filling it with cinders or sand, and spraying on the necessary chemicals for plant growth, in water solutions. Where plant diseases are prevalent, the concrete is sterilized first.

Nutrient solutions, sprayed on every

PUTTING "WOMAN'S WORK" ON AN EIGHT HOUR DAY

"We are working on a revolutionary design for a dishwasher—Can you furnish the type Micro Switch it will require?"

One day—and soon, we hope—we will build the series of Micro Switches needed to control the fully automatic operation of this new type dishwasher.

This manufacturer, and hundreds of others, are getting ready to apply advances in scientific knowledge, gained through war production, to new appliances for the home which will modernize "woman's work that is never done." We will have a part in that program of putting the homemaker on an eight hour day.

But we can't do so yet. Our duty now, like that of the Armed Forces, lies solely in continuing to plan and produce for the war program to our full capacity, that we shall not be caught short by unexpected emergency. Quantity production for peacetime business must wait until we complete our war job.

More than 2700 different combinations are now available in Micro Switches, developed to meet widely varied requirements. Many of these will find new applications in postwar products. Undoubtedly many new combinations will be developed.

The constant inflow of requests for Micro Switches to be utilized in postwar designs is a vote of confidence from industry for which we are profoundly grateful. We are eager to serve these manufacturers at the earliest possible date.

In the meantime, a knowledge of the outstanding advantages of Micro Switch will prove valuable to you in designing postwar products for the rapidly approaching day of intense competition. For this purpose, let us send your engineers as many copies of the Micro Switch Handbook-Catalogs as you may require.

The basic Micro Switch is a thumb-size, feather-light, plastic enclosed, precision, snap-acting switch, Underwriters' listed and rated at 1200 V. A., at 125 to 460 volts a-c. Capacity on d-c depends on load characteristics. Accurate reproducibility of performance is maintained over millions of operations. Basic switches of different characteristics are combined with various actuators and metal housings to meet a wide range of requirements.

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The Flavor of Home

As comfortable as your favorite chair, because each Kaywoodie Pipe is measured and balanced for comfort and ease. Each one is a perfect example of proper proportion and weight-distribution. (Kaywoodies have been selected by numerous Arts and Crafts Exhibits in the U. S., as specimens of fine proportion). So satisfying to hold in your mouth that you'll always welcome it, and pleasing to hand and eye as well. The flavor you draw from a Kaywoodie is just about the pleasantest, most enjoyable you'll ever experience from tobacco—If you've been unable to find Kaywoodies lately, it's because of great demand by the Armed Forces. We're sure you'll agree that we must serve our fighters first! Kaywoodie Company, New York and London. *630 Fifth Avenue, New York 20, N. Y.*

War Bonds come first

Premature fruit-dropping is a source of worry to any orchard owner. One answer is chemical treatment. To prevent 1944 crop loss, about 1,300 acres of Yakima Valley apples and pears were sprayed with naphthalene acetic acid solution, by a specially equipped plane of Central Aircraft Co., Yakima, Wash. Also by plane, University of Idaho has been testing "chemical frost" to kill potato vines and thus help mature an early crop.

two or three days, may contain potash, phosphates, calcium, ammonia, sodium, bromine, and iron. Yields sometimes are enormous, but the drawback is that the initial investment is comparatively heavy.

• **Orchard-Control**—Boyce Thompson Institute for Plant Research, Inc., Yonkers, N. Y., the U. S. Dept. of Agriculture, and a number of state colleges have been using chemicals to change normal life processes of vegetables and fruit trees. Some of these chemicals (parachlorphenoxyacetic acid is one) substitute for pollen and produce seedless tomatoes. Others delay the budding of fruit trees until a predetermined time, to avoid the financial loss of a late killing frost. Others, sprayed at fruit ripening time, prevent the usual losses from premature windfalls, by delaying the formation of a brittle stem.

Carbide & Carbon Chemicals Corp. makes a carrying agent for these chemicals, sometimes called synthetic plant hormones. It is a water-solvent solid, Carbowax, which also has many other uses. Du Pont markets a chemical called Parmone, a preharvest fruit drop spray American Cyanamid Co. recently acquired a new patent for a dispersing agent to be used with synthetic plant hormones. And many other companies have joined the parade.

• **Pelleting Possibilities**—In the pelleting of single germ units of sugar beet seeds (BW—Aug.26'44,p52) Dow Chemical Co. sees "unlimited future possibilities for comparable treatment of all seeds." After chaff and defectives are eliminated mechanically, each segment becomes the core of a little pill which also contains fertilizer and fungicide, to prevent diseases in the delicate period of early growth. The company is testing growth-accelerating chemicals, which may be added later. Phelps Vogelsang of Dow is credited with development of the seed-pelleting technique to make possible almost complete mechanization of sugar beet culture.

By some obscure life process, plants disengage themselves from any leaf which suffers injury or damage. American Cyanamid takes advantage of this tendency in cotton plants to market a defoliation chemical that is sprayed on 30 days after cotton bolls appear. The leaves fall and the bolls stick out like so many sore thumbs, for easy picking. This development may accelerate the use of mechanical pickers.

VI. WAR ON BUGS

Chemical pest-killers are of two kinds, the weed-killers, and the bug-killers. One weed-killing chemical is ammonium sulfamate, the same ingredient used in flame-proofing compositions. Other specific weed poisons, to which the tobacco "weed" is impervious, are prescribed for tobacco plant beds.

• **Enter, DDT**—Bug-killing chemicals have reached a new peak of effectiveness. The contemporary sensation of this

The New Fire

WE may sometimes wonder what kind of people we are—Americans, yes.

But...

Whenever there is a human need or a catastrophe—we are quick to respond.

We are defenders of the human being.

We are fighters for the rights of every man, woman and child.

Let's look at the record.

In less than two hundred years our youth, our vigor and our courage have given men a new way of life.

Today, the average family in this nation enjoys more benefits than kings of old: Light—Power—Education—Freedom and Opportunity—for all time.

That is what we stand for.

We want to build—never destroy—

We want to advance science and knowledge and the well-being of every individual.

This is the fire of America—

The flame that will never die—

The hope for men and women and children to come.

One of the fruits of this fire has been our industrial growth.

Groups of men have banded together and worked together to bring to us the wonders that have made all the world look to America.

In our hour of great need, free men working in great industrial plants, at the bench, in the office, in the laboratory HAVE FORGED AND BUILT THE INSTRUMENTS WHICH ARE DESTROYING OUR ENEMIES.

Today, WAR.

TOMORROW, this same fire will build for America—and through example, for the world—a security, a freedom, an economy in which children can be born and grow up—free from fear, want and repression.

★ ★ ★

In such a land when a group of men working together place after their company's signature such words as—"Serving through Science"—those words are inspired by that fire of America—the fire that ultimately means new health, new strength, and new opportunity for countless millions yet unborn.

UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE • ROCKEFELLER CENTER • NEW YORK 20, NEW YORK

SERVING THROUGH SCIENCE

family of products is DDT (BW—Feb. 12'44,p61).

Its correct chemical name, according to Chemical & Metallurgical Engineering, a McGraw-Hill publication, is 2,2-bis (parachlorophenyl) 1,1,1-trichloroethane. Most chemists just try to call it dichloro-diphenyl-trichloroethane. Relatively speaking, they say, it's not specially complicated in chemical structure.

DDT's reputation has a firm foundation in its victory over the Army louse. About 2,000,000 persons, troops and civilians, were treated with DDT on the heels of the invasions of Sicily and Italy, with the reported result that not one American soldier contracted typhus.

• **It Sticks**—The quality that sets DDT apart from other insecticides is what chemists call its residual effect. One application keeps clothing free of body lice or other insects for about a month, regardless of the usual launderings. DDT sprayed on screens or walls retains a poison for flies and mosquitoes that lasts half the summer.

With such a product to stimulate additional research, mankind has new weapons promising eventual freedom from disease-bearing insects such as lice, fleas, flies, mosquitoes, and ticks; from household pests such as moths, cockroaches, and bedbugs, and from the insects that frequently kill crops, orchards, and shade trees.

• **How It Started**—Although DDT has been a wartime sensation, it was no wartime quickie. It is the product of a commercial research project that the 180-year-old Swiss dye and chemical company, J. R. Geigy A. G., started in Basle, Switzerland, more than 15 years ago. The idea was to develop some chemical that would mothproof wool fabrics. After ten years' research, DDT came out in 1939, just in time to save the Swiss potato crop from an aggressive alien, the Colorado potato beetle.

In the course of their research, Geigy chemists had observed that one of their dyestuffs made fabric mothproof. Investigation showed the dye in pure form had no such effect. They patiently went to work to find impurities, and discovered a "para-dichloro-diphenyl group." They isolated 32 similar dichloro substances, and found only one that killed moths.

• **Penetration Wanted**—In the light of this discovery, the chemists explained they proceeded to "hook on a powerful solvent (chloroform) radical," to their dichloro-diphenyl insect poison and thus came out with DDT. It turned out to be a double-barreled toxicant, having both contact and stomach poison action.

Dr. Paul Mueller, who prepared this synthetic, applied it to a potato field heavily infested with larvae of the Colorado potato beetle. He took to his laboratory a spadeful of sprayed earth containing larvae about to enter the pupal stage. The following day, every larva in his soil sample was dead.

• **Had Been Synthesized**—Then it was discovered, Geigy reports, that the same synthetic (DDT) had been synthesized by Othmar Zeidler, a German student, back in 1874. Zeidler did nothing with it because apparently he was synthesizing chlorinated compounds. Chemists who came across his account previously hadn't paid any attention to it.

• **Rush War Job**—When Geigy brought out DDT in 1939 its American relative, Geigy Co., Inc., wasn't immediately excited because on its home grounds, the Colorado potato beetle was being controlled with cheaper lead arsenate. But in 1942, a powder, prepared from DDT (Neocid) tested by the U. S. Dept. of Agriculture and reported to the Army, proved so effective that Cincinnati Chemical Works, a Geigy affiliate, was pushed into immediate production. One raw material, which proved an early bottleneck, is chloral hydrate, known to the underworld as knockout drops.

Realizing that DDT stories already have drawn something of a backfire of warnings against possible toxic properties for humans, and that orchard sprays can kill the bees as well as the bugs, and thus prevent normal pollination and fruit production, Geigy Co. prudently refrains from proclaiming its discovery as a universal knockout for destructive insects.

• **Postwar Problems**—When DDT is available for civilian use, according to C. J. Dumas, head of Geigy Co.'s insecticide division, it will be specially compounded for specific uses, and it should be remembered that "for best control, vehicles that carry DDT must be compatible both chemically and physically." Questions, as of preparations to be marketed first, of how widely manufacturing licenses will be distributed, and of selling prices, haven't been determined.

In each application, DDT will have to compete with established products. These include such potent synthetics as the thiocyanates (Rohm & Haas' Lethane, Hercules' Thanite), such common poisons as lead arsenate, and such vegetable poisons as rotenone and pyrethrum.

• **Commercial Possibilities**—However, it's generally agreed that commercial possibilities are enormous. For example, DDT has proved its effectiveness against the coddling moth, an enemy of apple orchards, which seems to be developing some tolerance for lead arsenates. One observer figures that for this application alone, Geigy has a potential market of 15,000 tons of DDT insecticide a year.

But DDT's appeal to the public may

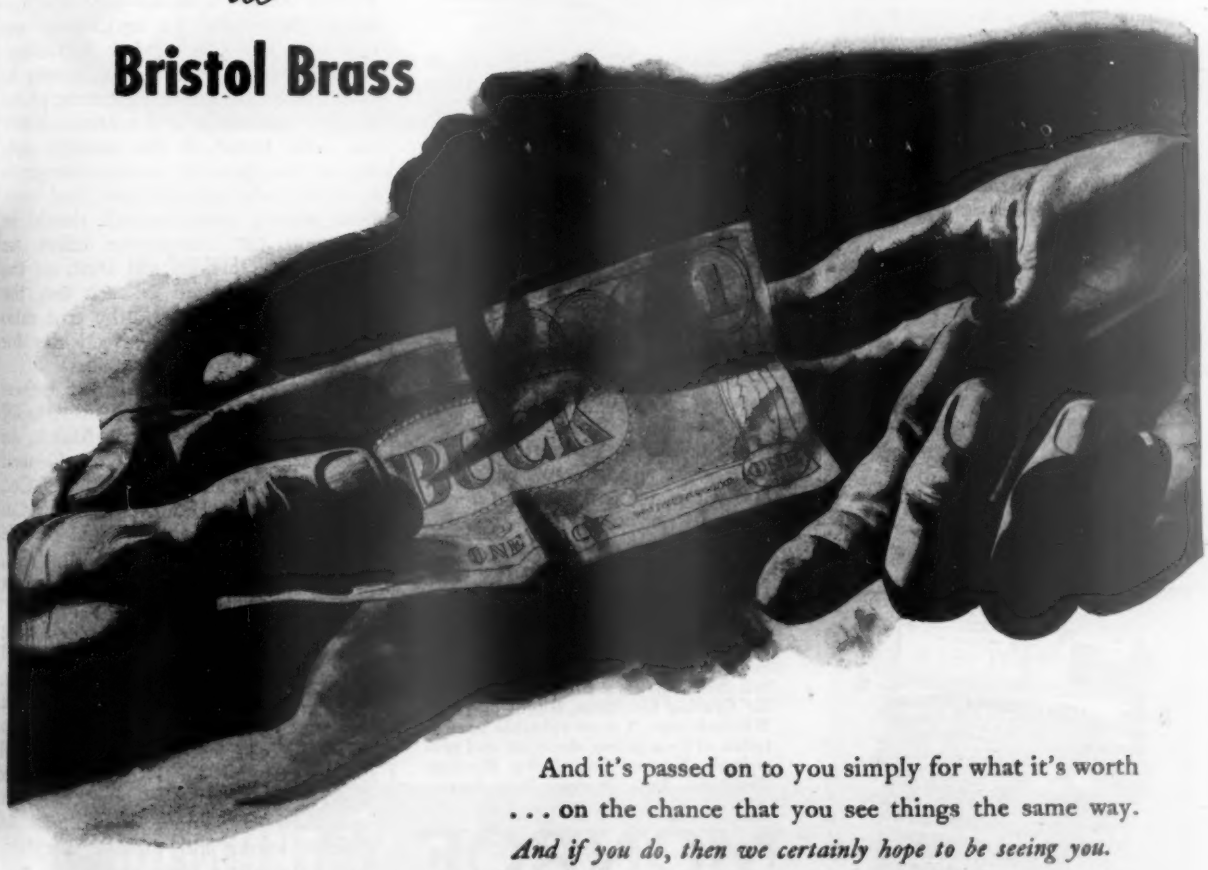
Testing "bug bomb" containers at the end of a Westinghouse assembly line set up for the Army. To spray insect-killing chemicals, each bomb carries a load of compressed Freon-12, originally developed as a safe refrigerant

You'll find your business will not pass from hand to hand at

Bristol Brass

No buck-passing . . . that's one of the first things you will notice, when you begin to do business with Bristol Brass. You get your answers promptly and straight from the shoulder, and you get them backed up with performance. For we figure that if we can save your time as well as our own, then we're both that much farther ahead, and can get more done to our mutual satisfaction. As a matter of fact, what could be easier to do without than outworn formalities, red tape, and "buck fever" in the face of responsibility?

This seems no unusual philosophy at Bristol, because it's been practised here for 94 years. But once in a while someone drops a remark that it's something new in his experience *actually to enjoy* doing business with a supplier. All of which is deeply appreciated.



And it's passed on to you simply for what it's worth . . . on the chance that you see things the same way. ***And if you do, then we certainly hope to be seeing you.***

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"I helped my boss *make the 6 o'clock plane!"*

Where SPEED and RESULTS are of first importance, you find Monroes. Management and office workers alike appreciate the simplicity of Monroes—the convenience and directness of operation, the all-around, fast performance, the "Velvet Touch" keyboard and easy operating bars that dispel fatigue.

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Why not bring to your own business the same economies and benefits that Monroes make possible in other business establishments? Without obligation a representative from the nearest Monroe branch will outline these benefits to you in detail with special reference to your own needs and will explain the availability of Monroes at present. Ask about our Guaranteed Maintenance Plan to keep your Monroes in top operating condition.

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be chiefly as a fly-killer. Dr. Victor Froelicher of Geigy's New York research staff said there's no evidence yet that DDT is a repellent. He sprayed a strip of DDT on a table, and watched its effect. A fly walked across the table and back again, crossing the DDT area without hesitation. Soon it began to dart across the room like an arrow. When it alighted, it began to clean its legs in typical fly fashion—and to find that it had navigating trouble. Its front legs were affected first, but flying wasn't disturbed immediately. Then, after several minutes, all legs were paralyzed and the fly fell on its back, but showed signs of life until the next day.

Dr. Froelicher amused himself by calculating how much DDT it takes to kill a fly. On one square centimeter (or 0.155 sq. in.) the amount, he figures, would be 1/100,000 of a microgram. A microgram is 1/1,000,000 of a gram, and a gram is 0.03527 of an ounce.

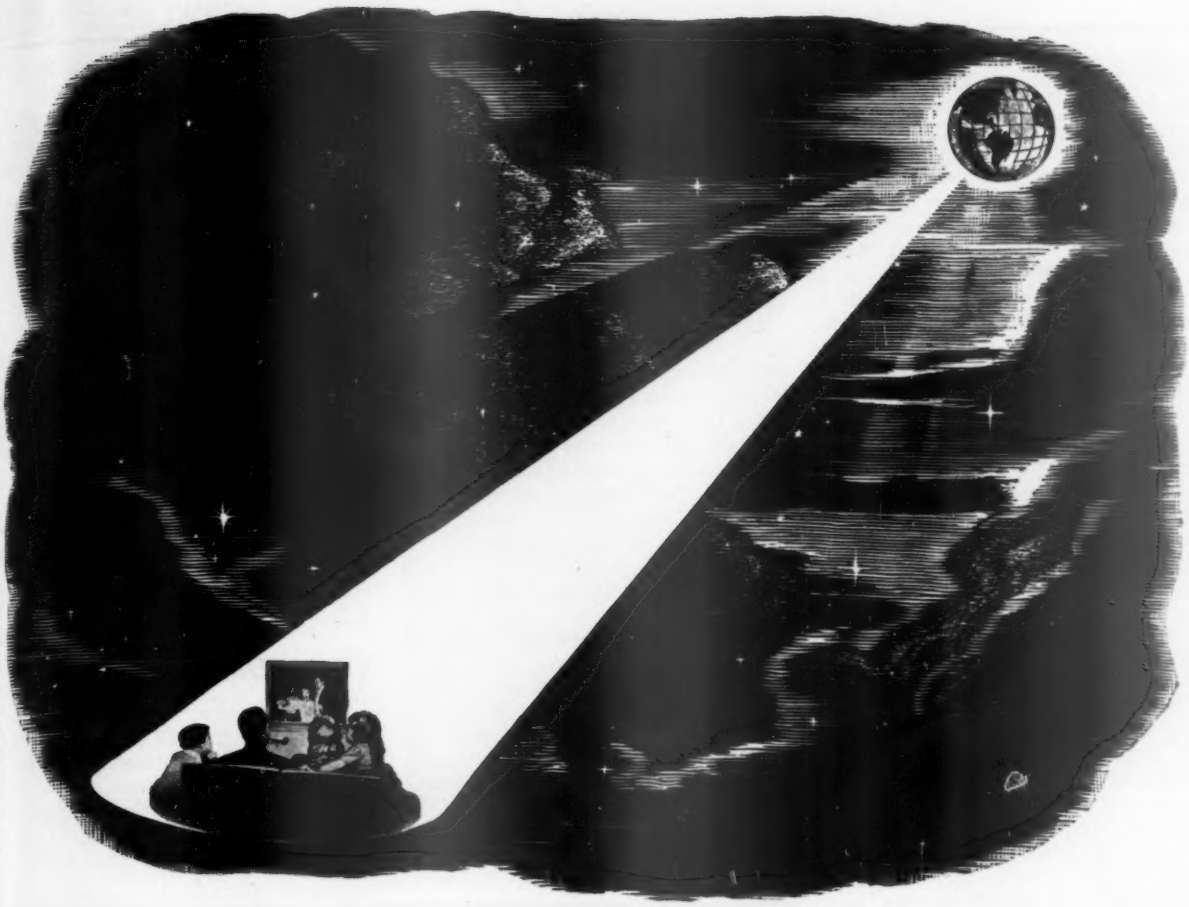
Some tests reported show that, when DDT is first applied to cockroaches, it also stimulates excessive activity, then proves deadly within 24 hours.

• **More Research Ahead**—Before it can be recommended for agricultural use generally, says Chemical & Metallurgical Engineering, more data should be collected on the effect on specific plants under a wide range of conditions—DDT has been tested in this country only during two growing seasons—danger to livestock, wild animals, birds, and beneficial insects; more research should be done on the cumulative effect on humans of DDT-sprayed fruit, on the mixtures best suited to each use, the methods of application, the cost ratio compared with other insecticides for each insect and crop.

Besides Cincinnati Chemical, others producing DDT, now exclusively to fill government orders, include Merck, du Pont, Hercules Powder Co., General Chemical Co., Sherwin Williams Co., and American Home Products Co. Others likely to enter the field include Pennsylvania Salt Manufacturing Co., Michigan Chemical Co., and Pharma Chemicals Corp., New York.

• **Other Killers**—DDT is stimulating research on other synthetic chemical bug-killers. One is phenyl cellosolve, customarily used as a perfume fixant and solvent. A report to the American Medical Assn. last year describes trial applications by Dr. Robert E. Cox of Bellevue Hospital, New York, on more than 50 children, in a solution of alcohol, water, and methyl salicylate, "just to give it a clean smell."

Dr. Cox reported "no live lice were found after a single treatment," and there were no irritating after-effects.



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The time is here for America to revise its concepts of its living-rooms, its classrooms, its town halls. The time is here to become familiar with new measurements of human progress... economic, political, scientific.

For full-scale Television is near... a force of unparalleled power. Television will carry new thoughts, new hopes, new products into millions of homes. It will stir men's minds and hearts in a matter of moments. We will watch the truly wonderful tomorrow take shape before our eyes.

DuMont will provide you with the finest in Television reception... sight and sound. DuMont quality will be assured by impressive prewar pioneering in Television, by vigorous wartime development, by highly specialized production "know how," by advantageous patents.

Indeed, the world stands on the threshold of an astonishing age... DuMont Television is ready... Are *You?*

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DUMONT *Precision Electronics and Television*

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Similar results were reported when a similar treatment was given to entire populations of Mexican villages, in collaboration with the Mexican Dept. of Public Health.

For killing flies, some producers think a combination of DDT and pyrethrum may be better than either one alone. Pyrethrum is a knockout type insect powder of vegetable origin. A good substitute may be synthesized from a chemical called ammonium thiocyanate. Until recently, only small amounts of this were available in this country. It was shipped in from Germany for chemical testing purposes. Now, Koppers Co. makes it by the ton for the other chemical companies having Army contracts for pyrethrum substitute.

• **Bug-Bomb Materials**—The Army "bug bomb," also known as the aerosol bomb, a special type of pressurized spray gun, is strictly nonexplosive. It only fizzes. It works something like a seltzer bottle, except that, in place of carbonic acid gas (seltzer) and water, it is filled with insecticide (DDT, pyrethrum, or pyrethrum substitute) and Freon-12 fluorine refrigerant (used as a propellant only), the same kind of nonpoisonous, nonflammable fluid that is used in mechanical refrigerators.

When compressed, Freon is liquid. Released from compression, it evaporates into a gas and, in evaporating, absorbs heat from its surroundings. That's the essence of mechanical refrigeration.

• **Job for Freon**—Other gases that may be liquefied easily by compression pumps can do the same refrigerating job, but all others seem to be either smellier or dangerous. Thomas Midgley, Jr., the famous chemist, recently deceased, who discovered that tetraethyl lead in small quantities makes gasoline a better engine fuel, and Albert L. Henne presented Freon to the American Chemical Society in Atlanta in 1930. Midgley dramatized its nontoxic properties by taking a load of it into his own lungs. The chemists, usually a cold, skeptical lot, stood and applauded.

Kinetic Chemicals, Inc., organized by General Motors and du Pont to manufacture and sell the refrigerant, named it Freon. Its chemical name, dichlorodifluoromethane, proved nonexhilarating to the marketing end of the business.

• **Civilian Uses**—Midgley had no idea of discovering an agent for carrying bug-killing chemicals. But that's what he did. Kinetic Chemicals looks forward eagerly to a civilian market in that field. Plant capacity, recently stepped up 60% with completion of a new plant at East Chicago, Ind., has reached 5,500,000 lb. of Freon a month. Westinghouse, fabricator of the soup-can size bug bomb, is working on its second 10,000,000. Other manufacturers of aerosol bombs include Pennsylvania Engineering Co., Philadelphia; Regal Chemical Co., Brooklyn; Armstrong Engineering Co., Bayway, N. J.; and Industrial Management Corp., Valparaiso, Ind.

Insecticide manufacturers are not prepared to say that bombs of this kind will replace all sprays, but they do believe the aerosol bomb will be a strong factor in competition.

In the war on insects, the synthetics known as wetting agents also have been effective. Carbide & Carbon Chemicals Corp. reports that a deadly spray for the Japanese beetle contains 0.5% of a Tergitol penetrant, or wetting agent, 0.02% pyrethrum resins, and no other organics.

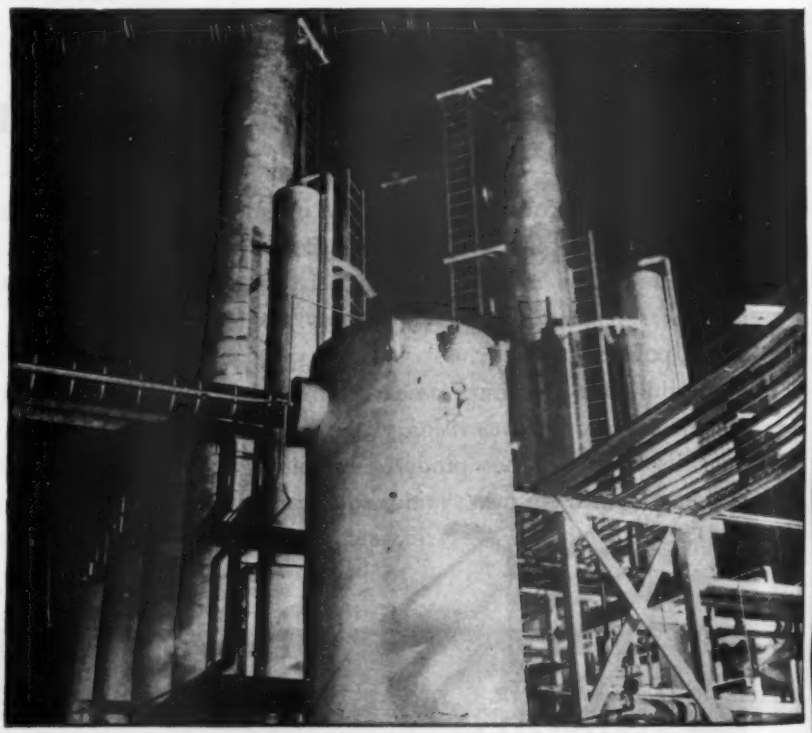
• **Animal Protection**—The chemical, phenothiazine, used experimentally in orchard sprays, has been found so effective in the control of parasites that fasten themselves in the digestive systems of sheep that it has been called, "the sulfa drug of the animal industry." Its application in veterinary medicine was discovered by Dr. Paul Harwood, (now of Dr. Hess & Clark, Inc.) while he was working in U. S. Dept. of Agriculture laboratories.

Phenothiazine also has been found effective in ridding cattle, swine, poultry, goats, and horses of certain internal parasites.

• **Work for Repellents**—Sometimes an insect-repellent is more desirable than an insecticide. Combat troops can't stop to spray mosquitoes before plunging ahead to kill an enemy. That's why repellents used in camouflage skin creams have been in demand for the hot, swampy South Sea islands. And because civilians might not always find it polite or convenient to carry a bug bomb to the picnic or to the neighbors' screenless porch, some chemical manufacturers plan to penetrate the civilian market for insect-repellents through cosmetic manufacturers. Carbide calls one of its repellents, Eveready 612. Its chemical name is 2-ethyl hexanediol-1,3.

VII. "CHEMOTHERAPY"

The expression, "mass production," means all things to all chemicals. Fine chemicals and pharmaceutical companies have achieved "mass production" of penicillin (BW—Nov.6'43,p66) at the rate of 200,000,000,000 "Oxford units" a month. But if these manufac-



Penicillin plant at Terre Haute, Ind., which Commercial Solvents brought from idea to output within six months. Vats are for submerged fermentation.

turers measured their output of this sensational drug in pounds a day, they would have to report the unimpressive number, 17.

(The auto industry, if it produces 6,000,000 cars a year, will be producing about 60,000,000 lb. daily.)

• **Big in Doses**—Chas. Pfizer & Co., whose new $3,500,000 penicillin plant in Brooklyn is said to account for half the U. S. production, suggests a more understandable measure. Its production is 50,000 bottles of penicillin daily, and each bottle contains five average doses. The whole industry, then, is delivering 500,000 doses of penicillin a day. One month's production is more than production for the entire year 1943. And since the beginning of 1943, the price has been reduced from about $20 a bottle to $1.50.

Penicillin had a considerable time lag between discovery and development. In 1929 Alexander Fleming, a London scientist, published a report stating that cultures of the mold, penicillium notatum, killed staphylococcus bacteria. New research at Oxford University confirmed these findings ten years later. The medical profession began to sit up and take notice. By 1942 experimental production was under way in the U. S., and last year about 20 manufacturers had decided upon commercial production. Penicillin had proved itself valuable in fighting many kinds of infections, not only the "staph" kind, but also the dreaded meningitis, venereal diseases, and many others.

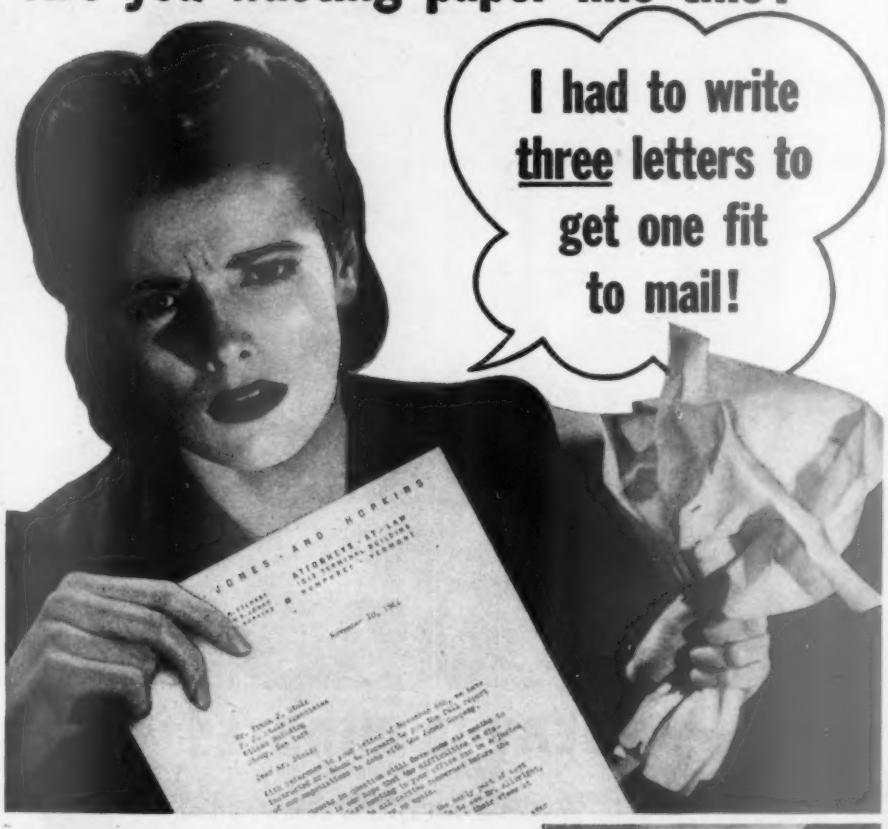
• **This Year's Baby**—One large penicillin plant, which Commercial Solvents Corp. erected at Terre Haute, Ind., was only an idea in August, 1943; it began to produce on Jan. 30, 1944. It uses the submerged fermentation process in huge vats, processing up to 800,000 gal. of liquid a month to get a final dry product of less than 100 lb.

Penicillin mold colonies grow in immaculate factory surroundings unrelated to their humble beginnings. One high-potency strain began to develop in a decaying cantaloupe. Another came from a piece of cheese. They multiply best on a diet of corn-steep liquor, by-product of the corn products industry, and lactose, or milk sugar.

• **For Civilians, Too**—American producers are meeting all armed service requirements for penicillin; the remainder of their product is carefully funneled through government controls for necessary civilian medication. Nobody in need of penicillin late this year, if he had access to a physician, had to do without, and there was a small margin left over for lend-lease.

Producers, besides Pfizer and Com-

Are you wasting paper like this?



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BW 11-25

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EVERY 10 MINUTES

In war production, and again in civilian business, Kerrick Kleaners will save up to 80% of the man hours normally required for a multitude of automotive and industrial cleaning jobs. Today, in manufacturing plants and maintenance shops, limited cleaning crews are getting the job done because they are using Kerrick's.

Kerrick Kleaners remove dirt and stubborn grease from motor vehicles, machinery, floors, tiny precision parts or complete buildings . . . faster, better and cheaper.

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mercial Solvents, include Abbott Laboratories, Allied Molasses Co., Ben Venue Laboratories, Cheplin Biological Laboratories, Cutter Laboratories, Heyden Chemical Corp., L. F. Lambert Co., Lederle Laboratories, Eli Lilly & Co., Merck & Co., Parke, Davis & Co., Reichel Laboratories, Schenley Research Institute, E. R. Squibbs & Sons, Upjohn Co., Winthrop Chemical Co., and two Canadian companies, Ayerst, McKenna & Harrison, Ltd., Montreal (American Home Products subsidiary), and Connaught Laboratories, Toronto.

Practically every organization having a commercial stake in penicillin has been investigating the possibility of synthesizing a chemical equivalent; but, so far, the rapidly multiplying penicillium notatum family seems safely anchored in its nepotism.

• **Bacteria on Our Side**—Destruction of bacteria with enemy bacteria is not new; it has been going on in nature for millions of years. Dr. Rene J. Dubos of Rockefeller Institute observed that the soil destroys microbes that prey on humans, and in 1939 he found, through patient research, that a substance now known as tyrothricin, or gramicidin, produced by the soil organism brevis bacillus, will kill bacteria of pneumonia, streptococcus, and staphylococcus.

Gramicidin's usefulness has been limited, so far, to such things as surface wounds and ulcers. It is said to be toxic in the human blood stream or digestive system.

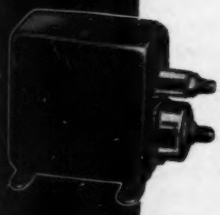
• **Chemistry for Health**—Penicillin and gramicidin are two of the most recent applications of chemistry to medical practice, called chemotherapy. Its foundations were laid in the last century beginning with Louis Pasteur.

However, the first great discovery that began to build chemotherapy on the findings of bacteriology took place in Germany, about 1910, when Paul Ehrlich climaxed years of research by synthesizing salvarsan, a chemical specific for syphilis, from aniline, arsenic, and the hydroxyl and amido groups of chemicals.

• **—And Then, Sulfa**—There wasn't another significant contribution to chemotherapy until the sulfa drugs (BW—Apr.1'39,p33) came along a few years ago. A German scientist, P. Gelmo, first synthesized sulfanilamide in 1908 for use in dyes. Its germ-killing properties were recognized 24 years later in a German patent on prontosil (sulfamidochrysoidine), and in 1935, Gerhard Domagk of the German Dye Trust announced that prontosil, although relatively innocuous, would protect mice against fatal doses of streptococci.

Scientists in the Pasteur Institute at

● Slowly the contact arm moves nearer the magnet — then — SNAP! Contact is made and the compressor comes to life. Here, in PENN'S commercial refrigeration control, *Snap Action* is at work, maintaining pressure and temperature.



Here is that "extra something" that marks all PENN automatic controls. Extra efficiency because Snap Action makes and breaks the circuit quickly and positively. Extra life because Snap Action curbs arcing and the burning of the contacts. Extra convenience because Snap Action operates in any control mounting position . . . sideways . . . upside down. Extra reliability because circuits cannot be made or broken by vibration. Extras all—and all in one self-contained unit.

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FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

"Just have to keep on livin', ma'am—"

The U.S.O. hostess recognized wings, and rank, but the face was too young for the silver leaf on his shoulder.

"Heavenly day!... How do you Air Force boys run up so much rank so fast?" she asked.

"You just have to keep on livin', ma'am," said the youthful 8th Air Force Lieutenant Colonel... and he wasn't being at all facetious!

SINCE last summer they have been trickling back... with rows of ribbons under their wings, foreign service stripes, and the shoulder patch with the "8" between the spread wings of the Air Forces emblem. Too few of us know either the marking or its meaning.

The 8th Air Force began with the first few Flying Forts sent to England in early 1942... proved that precision bombing by day was practical—and deadly... fought with the R.A.F. 500 miles deep in Fortress Europe despite 40,000 anti-aircraft guns, flocks of Focke-Wulfe fighters... and sickening losses to the original group.

With 1943 came reinforcements; but the Ploesti oilfields cost 54 bombers, the two Schweinfurt raids 96. Before the year's end, 60% of the flying personnel were dead, wounded, listed as missing, prisoners of war. At its peak in Spring 1944, the 8th lost in one fateful week in February 170 bombers, shot down 548 German fighters, broke the back of the vaunted Luftwaffe.

In a year of hard, persistent fighting, the 8th battered the German war machine and its industrial resources, shriveled Nazi nerves. When D Day came, American armies never met the full strength of the mighty Wehrmacht, but an enemy weakened by disorganized communications and supply lines.

What most Americans fail to realize is that the 8th Air Force saved the lives of hundreds of thousands of doughboys, shortened the European war by perhaps a year... earned more decorations and citations than any other military unit in history, as well as our undying gratitude. Watch for the 8th shoulder patch, and honor the men who wear it!

MANY of the 8th Air Force and other AAF bombing personnel were schooled in twin-engine training planes powered with engines made by Jacobs... a fact of which we are justly proud... Jacobs Aircraft Engine Company, Pottstown, Pa.

JACOBS • **Pottstown, Pa.**

Paris found that the effective drug in prontosil was sulfanilamide. Use of the drug in this country was pioneered by Dr. Ashley Weech of Babies Hospital, New York, and by Dr. Perrin H. Long and Dr. Eleanor A. Bliss of Johns Hopkins Hospital, Baltimore.

• **Careful Development**—Chemical manufacturers point out that the first sulfas, although widely acclaimed as wonder drugs, were toxic to about half the patients for whom they were prescribed. It took a good deal of careful research to extend their usefulness by developing modifications.

U. S. manufacturers now have sulfa drug-producing capacity of 10,000,000 lb. annually. Production reached a peak of between 8,000,000 and 9,000,000 lb. last year. A combination of reduced buying by the armed services, which apparently had laid in heavy supplies, and competition from penicillin, has been pushing the sulfas' production downhill: the 1944 output isn't expected to be much more than 6,000,000 lb.

• **Rival for Quinine**—A discovery in synthesis which implies eventual independence from cinchona trees for quinine production was made in Cambridge, Mass., this year by two young scientists, Robert W. Woodward and William E. Doering, whose research was financed by Polaroid Corp. (BW–May 13'44,p51). Commercial production of synthetic quinine, however, may be delayed for years while an economical commercial process is developed.

The project yielded more immediate commercial possibilities in the synthesis of quinidine, a heart ailment specific, which previously could be derived only from natural quinine.

VIII. TEXTILE CHEMISTRY

Eventually, some chemists say, textiles may be integrated with chemicals. There is some substance to the idea (Report to Executives; BW—Mar.4'44, p47). Nylon is a du Pont product. Vinyon was developed by Carbide. Saran belongs to Dow. But it's also true that chemical manufacturers regard textile manufacturers as important customers, and compete for their business accordingly.

• **Shrink-Proofing** — Shrink-proofing chemicals to make wool as washable as cotton have been announced recently by Monsanto (Res-loom) and American Cyanamid (Lanaset). The substance used is known as melamine resin, a group of complex, nitrogen-containing chemicals that have been familiar to chemists for about 100 years. But the discovery of a method to make the melamines water-soluble dates back only

Same wool fabric, same laundering, but the dress that didn't shrink had a melamine resin treatment at the mill. Untreated dress, unwearable.

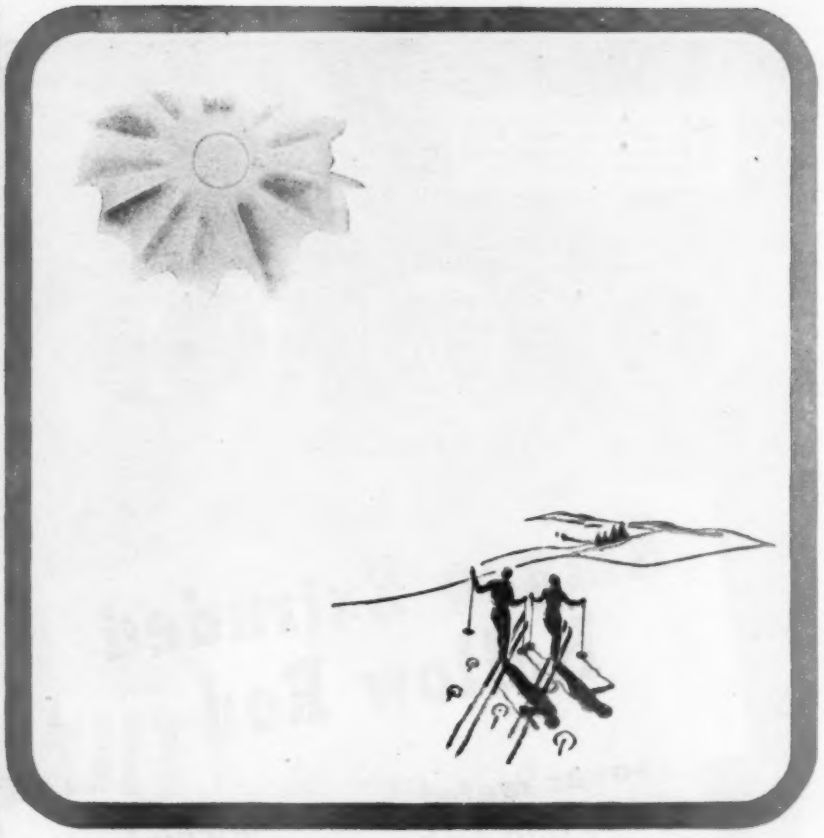
eight years, when William F. Talbot of the Boston consulting chemical company, Arthur D. Little, Inc., came up with the answer on assignment from Cyanamid.

Regular textile machinery is used in the treatment, a simple wetting and wringing-out process. But while the melamine resin impregnant offers no special processing problem, according to Donald H. Powers, in charge of Monsanto's textile research, it does create new conditions for designers.

For one thing, mills are urged to use a lighter weave. This means less wool per blanket, and since some of these resins cost 50¢ a pound, less than half the current price of wool, a net saving is claimed.

Another shrink-proofing treatment, reported recently by U. S. Industrial Chemicals, uses a solution of alcoholic caustic potash, alcoholic sulphuric acid, sodium bicarbonate, and a softening agent.

• **Quartermaster Tests**—Chlorination shrink-proofing treatment for wool, developed in England, tested by U. S. Army Quartermaster Corps and by the



"I see they're heating *houses* this way now"

Heat, given off by the sun and reflected by the snow, keeps Sun Valley skiers comfortable in light clothing even in the coldest weather.

Heat based on this same principle, but from copper coils concealed in walls, floors or ceiling can keep you comfortable at home...and at room temperatures lower than customary!

This is no postwar dream. In the files of Chase Brass are architectural reports on homes today enjoying the advantages of *radiant* heating. Tomorrow, thousands of houses—yours, perhaps, among them—will be heated more comfortably and economically, when copper is released for peacetime purposes.

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All the inherent advantages of Ampco Metal — its exceptional resistance to wear, impact, fatigue, and corrosion—its specific properties as an engineered aluminum bronze alloy, held within close limits by rigid quality control — are available to you in this convenient form.
Ampco Hollow Rod actually is replacing forged material in valve seats for aircraft engines — evidence of its clean, sound structure and excellent physical properties. It is intended primarily for bushings, sleeves, lead-screw nuts, and similar machine parts. Sizes closely parallel most requirements — saving material and time.
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Ampco Metal Parts fabricated from extruded stock

soldiers who wear wool socks (BW Jun.24'44,p76), also has proved su cessful.

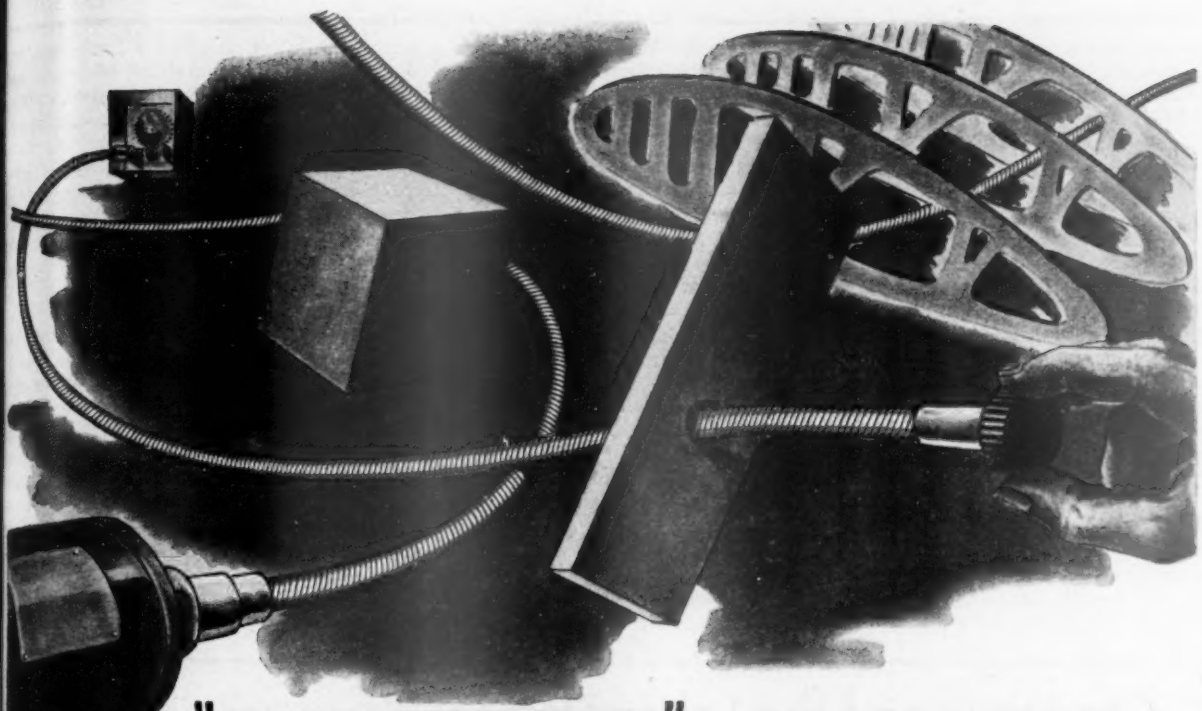
Wear resistance is increased abo 30%, according to the official stat ment, which relates that "a preferr chlorination process" easily done wit sock manufacturers' regular dyein equipment, consists of wetting th socks out thoroughly with any synthet wetting agent that is resistant to chl rine, then adding 4% calcium hypo chlorite (70% grade) based on weigh of the socks. Sodium bisulfite is adde later as an "anticolor," the socks ar rinsed and dyed, using tetra sodiu pyrophosphate in the last rinse wat before dyeing.

The Army found melamine resi treatments "promising," but hampere by the fact that "adequate curing facil ties are not available in the majorit of hosiery plants."

• **More Textile Aids**—A substance calle Syton is Monsanto's second ace, in bid for dominance of chemicals devote to processing the natural fibers. Syto is specially prescribed for treating hosier and for upgrading short-staple cotton. I is described as a nonorganic (containin no carbon compounds) polymer an film-forming material. Its behavior com pares with some of the resins, but it i pure silica (sand) reduced to submi croscopic size, and, in this form, enter into a firm alliance with such fibers a cotton and rayon.

Without being sticky or tacky, Syto is said to lend just enough drag to th fibers to prevent pulling apart, addin

Equivalent of distilled water flows from this diminutive chemical filter. Feed stock is common tap water.



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To S. S. White belongs the credit for bringing *flexible shafts* to their present high state of development and for greatly expanding their range and scope. Power drive and remote control applications of S. S. White shafts run well into the thousands in aircraft, motor vehicles, radio, electronics, tools, machinery and many other fields. Today, in all these fields, S. S. White Shafts have gone to war with the equipment in which they serve. And because *S. S. White flexible shafts* are basic mechanical elements offering the advantages of extreme simplicity and economy for power transmission and remote control, their use will continue to grow as time goes on. And S. S. White engineers will continue to exercise their "enginuity" in applying flexible shafts to new uses.

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Copies of any or all of the following literature will be mailed on request.

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Bulletin P-4305 — Plastic Dummy Shipping Plugs and Caps.

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SMALL CUTTING AND GRINDING TOOLS • SPECIAL FORMULA RUBBERS
MOLDED RESISTORS • PLASTIC SPECIALTIES • CONTRACT PLASTICS MOLDING

from 10% to 50% to a fabric's wear resistance.

• **Resins for Fibers**—Application of synthetic resins to the cotton fibers before they are spun and twisted, a method which figures to save most of the spinning and twisting processes of yarn making, recently was announced by Riverside and Dan River Cotton Mills.

This method also is recommended for application to the short-staple cotton surplus, currently estimated at 5,000,000 bales. However, it hasn't been developed to the point where it produces fine yarn, or the elastic quality required for tire cord applications.

IX. RESEARCH LOOKS AHEAD

Demand for chemical production has been surging upward with such force that during 1944, despite the ban on most kinds of construction, new chemical plants will amount to at least $100,000,000, according to D. P. Morgan, director of WPB's Chemicals Bureau.

• **War Expansion**—More than $1,200,000,000 has been invested in the "chemical war program," since 1939, according to Harry L. Derby, president of the Manufacturing Chemists Assn. and of American Cyanamid & Chemical Corp. About one-third of it has been private capital.

The chemical manufacturers know they are set up to produce about three times the tonnage of chemicals they sold in 1940, and they expect a sharp decline in total output when the war ends.

• **New Plants Coming**—However, representative manufacturers say that new plants are needed to take care of the newly created demands for the newer chemical products.

Many new developments are military secrets; others haven't been disclosed for competitive reasons. But enough straws are visible to indicate which way the wind is blowing.

Du Pont, giant of the industry, emphasizes the usefulness of nylon, not only as a textile fiber, but also in plastic form. It also looks for the development of a substantial market for urea resins for making "transmuted wood" (BW—Apr.22'44,p79), a tough, hard, wood and plastic combination that doesn't warp, shrink, or mar. Du Pont expects Freon, cellophane, Neoprene, and the new plastic, Polythene (BW—Jan.22'44,p69), to conquer other new markets.

• **Research Carries On**—Carbide & Carbon Chemicals Corp. has consolidated management of its various synthetic resins and plastics into a new "plastics group." Carbide's Bakelite dates back to Leo Baekeland, the great Belgian-American chemist who sold "Velox" photographic paper to Eastman Kodak for $1,000,000 to finance research that culminated in the discovery of the phenolic resins, a prolific family that has never stopped growing.

Allied Chemical & Dye Corp., most

Chemicals and the Labor Unions

Professional labor union organizers say the chemical industry is a tough nut to crack. Workers are few in proportion to plant investment, and they are paid higher than average wages. Furthermore, some of the largest chemical concerns have set up more benefits, in the form of pension plans, sick leave pay, bonuses, and vacations, than a union would dare to ask or hope to get in a first contract. Organized labor calls the industry "one of the most paternalistic of all."

• **Challenge to Lewis**—This state of affairs constitutes a challenge to the aim of John L. Lewis to bring chemical workers into his United Mine Workers, whose District 50 wants to enroll any worker, anywhere in America, who isn't a miner and already a member of some U.M.W. local.

On the first day of this year's U.M.W. convention (BW—Sep.23 '44,p104) Lewis promised that District 50 would come into its own when the war ends. The method is to be direct action. He said:

"I want to serve notice on the great manufacturers of chemicals and explosives in this country that the time is coming after this war when union men in the coal mines of this country will use no powder or explosive that does not bear the brand of this organization."

• **Union Lures**—Chemical division literature from District 50 plays up Lewis as a labor champion who won a victory over the coal industry. It also claims U.M.W. credit for health and safety regulations benefiting the chemical workers. It proposes to get such a national collective bargaining agreement as it has in coal mining. It promises better wages through annual wage contracts, premium pay for second and third shifts, seniority reinforced with management-union job-classification studies, vacations and sick leave by contract, grievance arbitration machinery, pension and group insurance without added cost to the workers.

Many chemical manufacturers will have to reckon with Lewis. Already he is the most powerful labor leader in that field. If strength of organizing effort can be measured by available organizers, Lewis has a wide margin: There are 200 staff organizers for District 50, compared with 20 or 30 reported in the A.F.L. International Chemical & Allied Products Union, and 35 or 40 in the C.I.O. United Gas, Coke & Chemical Workers. The A.F.L. and C.I.O. unions, however, have general organizers who might be thrown into a concerted drive, as rivalry developed in any particular plant or area.

• **Membership Claims**—District 50's chemical division claims membership of about 200,000—a claim that critics call "highly exaggerated"—and estimates the potential strength of chemical workers' unions at 1,000,000. Its C.I.O. rival claims 43,000. The A.F.L. union is reported to have between 40,000 and 50,000 in International Chemical, and it estimates another 20,000 are enrolled in federal locals, or units chartered by the federation rather than by its autonomous affiliate, the recently chartered International.

All three operate as industrial-type unions, whose membership embraces whole plants rather than individual occupations. The A.F.L. International Chemical, however, makes provision to respect the jurisdictional lines of craft unions previously organized in any plant it may organize.

District 50 has been in operation since 1936. The C.I.O. United Gas, Coke & Chemical union was a by-product of Lewis' split with C.I.O. in 1942.

• **Money for a Drive**—Per capita revenues of the three unions range from 60¢ to 75¢ a month. Apart from this income, all three parent organizations have strong treasuries with which to back up any drive they may decide to make.

Regardless of how well Lewis and his rivals in C.I.O. and A.F.L. unions can finance their membership drives, neutral observers, on the basis of available facts, don't expect the next five years to produce any strongly welded together, national organization of chemical workers.

A PEACEFUL TRIGGER

This peaceful trigger unleashes *power* instead of destruction. It is a symbol of the power that cooks your meals, lights your office, and keeps the machines in your factories working. Making the machines that harness power in all its forms, not only electrical but mechanical and hydraulic as well, is Hendy's specialty.

At the Joshua Hendy Division plant, Hendy makes huge, precisely machined and balanced turbines and turbo-generators, modern Diesels, large valves and gates, and hydraulic dredges—and makes them with the skill of 90-years' experience in building power equipment.

The Crocker-Wheeler Division plant specializes in the building of high-quality electric motors and generators. For more than fifty years, Crocker-Wheeler has pioneered in creative electrical engineering—in applying motors and generators to new industrial uses.

Get in touch with your nearest Hendy office whenever you want information on power equipment. Our field engineers will be glad to help you.

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JOSHUA HENDY DIVISION • *Steam Turbines, Turbo-generators, Diesels, Gears, Valves and Gates, Dredges, Mining Machinery*

CROCKER-WHEELER DIVISION • *Motors and Generators*

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JOSHUA HENDY IRON WORKS

ESTABLISHED 1856

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CONCRETE . . .

BUILDS

The rugged strength and durability of concrete assures low annual cost for all types of construction.

Homes with concrete walls, floors and firesafe roof build out maintenance expense, giving years of comfort and low cost shelter.

For industrial, commercial and public buildings, the strength, durability and firesafety of concrete spells low annual cost, a true business asset.

For all but the lightest traffic highways, streets and airports, concrete pavement usually costs less to build than any other pavement of equal load-carrying capacity.

Low first cost plus low maintenance cost make concrete the low annual cost pavement.

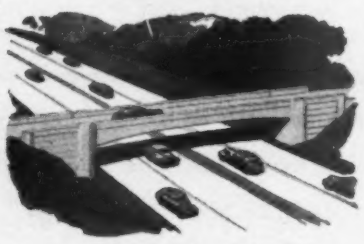
• • •

Whatever you plan to build please remember that concrete gives you low annual cost—the true measure of construction economy.

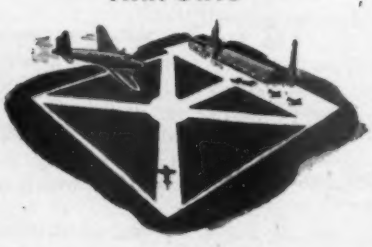
LOW ANNUAL COST HOMES

LOW ANNUAL COST FACTORIES

LOW ANNUAL COST HIGHWAYS



LOW ANNUAL COST AIRPORTS



PORTLAND CEMENT ASSOCIATION

Dept. 11d-12, 33 W. Grand Ave., Chicago 10, Ill.

A national organization to improve and extend the uses of concrete . . . through scientific research and engineering field work

BUY MORE WAR BONDS

reserved and conservative of the "b three" (du Pont, Allied, Carbide), seem to be going in for research more heavi than ever before. It has purchased, fo its research work, the former Ot Kahn estate at Morristown, N. J. It h several new plants under construction including a tar distillation plant of i Barrett division at Ironton, Ohio, whic it predicted would keep growing, "i view of the tremendous future of th chemical industry."

Pennsylvania Salt Manufacturing C has also bought an estate for location its research activities, the former E ward Stotesbury property near Philade phia, recently dedicated as the Whit marsh Research Laboratories.

• **Into New Fields**—Koppers, who main business has been construction byproduct coke ovens, appears to shifting its emphasis heavily to the ma ufacture of coal tar chemicals. Wya dotte Chemicals, for many years pr occupied with the basic chemicals, su as caustic soda, soda ash, and chlorin has moved aggressively into the maki of intermediates for the new synthetic

Dow seems ready and willing to e pand further its chemical manufacturi capacity in the Freeport area of th Texas Gulf coast, as soon as construc tion isn't limited to war plants. It h been laying the groundwork for aggre sive development of new markets f magnesium and plastics, and for th extension of its seawater chemistry.

• **Jobs for New Plants**—Shell Chemic which brought out synthetic glycerin 1938, has been reaching out into ne fields in its chemical research and ma ufacturing, including a new plant make allyl alcohol, an intermediate f new laminated plastics.

Celanese Corp. is building a ne chemicals plant in Bishop, Tex. It pla further expansion of its organic pho phate family of plasticizers, lubrica additives, and insecticides, as well as plastics and fibers. Its resin film, Lum ith V. N., is described as "one of th unwoven textiles" to be offered the ci ian market later.

• **Plastics, Rubber, Paint**—Mathies Alkali Works has a chemical, dichlo styrene, "from which heat-resistant pl tic or synthetic rubber can be made and has made its own synthetic rubb still under development. Diamo Alkali is reported to have developed paint ingredient, which, under high te perature, gives off a fire-extinguish gas, carbon dioxide.

Durez Plastics has developed so new low-temperature resin adhesi and low-pressure casting resins. Da son Chemical Co. is making the pow or "fluid" catalyst said to have surf

area of 50,000 sq. ft. per cu. in. Among Sharples' new specialties are alkyl amines, more or less laboratory curiosities until a few years ago. Derivatives include a synthetic substitute for quinine and compounding agents useful in synthetic and natural rubber.

More Company Plans—Buffalo Electro-Chemical Co. reports development of a process for making solutions of acetyl peroxide that are "perfectly safe to handle." (Acetyl peroxide is an effective catalyst in polymerizing synthetic rubber and plastics.) Carbide reports that its glycol-base, Carbowax compounds also act as peroxide stabilizers.

Commercial Solvents, which may buy the government synthetic ammonia plant it has been operating, also expects to build new plant capacity to enlarge its production of the nitroparaffin group of chemicals.

"Just as William Henry Perkin's discovery of the aniline dye mauve in 1856 foreshadowed a chemistry which is still yielding valuable new substances," the company states, "so the nitroparaffins today offer unlimited opportunities to the industrial and research chemist."

Broader Fields—Atlas Powder Co. has developed a synthetic drying oil (K-oil) that it claims to be "better than tung oil" and is coming into the market with special plasticizing agents. Witco Chemical Co. has developed waterproof seals for overseas packages from an asphalt derivative.

Synthetic rubber has stimulated the chemical activities of the large rubber companies, and their interest in plastics. Tennessee Eastman (Kodak) has become a power both in plastics and in rayon. Schenley (penicillin), Quaker Oats (furfural solvents), and Armour (organics) also help demonstrate that, while chemicals serve all industry, each industrial entity, if it so desires, can make chemicals of its own.

Chemical Objectives—Some companies, like Pittsburgh Plate Glass Co., with its subsidiary, Columbia Chemicals, get manufacturing raw materials from their chemical operations. Others look to chemical engineering for possible processes and products that would permit conversion of waste into profits.

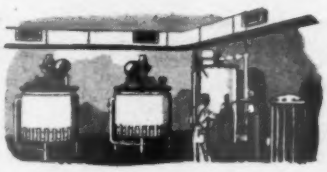
Hercules Powder Co., whose chemical manufacturing business is built on cellulose, naval stores (rosin and turpentine), and paper-making chemicals, has been doing some intensive experimentation with processes to treat rosin derivatives with hydrogen, and thus produce a whole new series of materials for lacquers, varnishes, and binders for impregnated and laminated plastics.

One of Hercules' recent developments has been a soil stabilizer, called Stabinol

and a job for "Air at Work..."

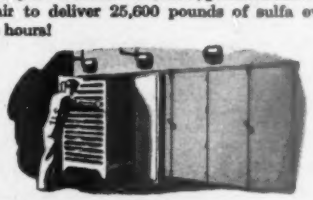
FOR BOTH SOLDIER AND CIVILIAN, sulfa pills are on the job today wherever infection threatens.

Producing this miracle medicine—enough and in time—is an epic achievement of the pharmaceutical industry... with a helping hand from "Air at Work", to speed processing, prevent waste and safeguard quality. Step into a sulfa plant and see how it's done:



1. MAGIC sulfanilimide starts life in a superheated still as sulfonyl chloride. Mixed with ammonia, agitated, centrifuged and decomposed in water—the crude sulfa is then ready for an intricate cycle of filtering and purifying operations. And at each step "Air at Work" is on the job . . . keeping airborne dust out of the plant, controlling pungent fumes and regulating indoor weather to assure uniform quality.

2. NEXT, sulfa powder is delivered to the packaging department cleanly and economically—by a Sturtevant pneumatic conveyor—and fed into the mixers. Then, in a special Sturtevant dryer, precision-controlled currents of air extract the moisture and assure a stabilized crystalline structure. Doubling the output of previous methods, this dryer "breathes" almost 2½ million cubic feet of air to deliver 25,600 pounds of sulfa every two hours!



3. POWDER is then ready for the tabletting machine, where the final job of "Air at Work" is to pick up excess powder left after each tablet is molded. The Sturtevant System salvages this powder for use again—and equally important, keeps the fine, irritating dust out of the air—away from workers.

AT CONVERSION TIME forging ahead of competition or even holding your own may depend in large measure on correct and adequate use of *engineered air*. Sturtevant engineers are ready to work with you or your planning committee *now*, to "Put Air to Work" as a cost-cutting product-improving production tool ... that heats, ventilates, air conditions, dries, controls dust and fumes, or burns fuel *more efficiently*.

B. F. STURTEVANT COMPANY
Hyde Park Boston 36, Mass.

Sturtevant
Puts Air to Work

(BW—Mar.18'44,p70), which acts as a sizing agent in soil, to prevent moisture absorption and thus prevent mud. Hercules has photographs of cars kicking up Stabinol dust in a rainstorm. It isn't completely effective in heavy traffic and heavy rain, but even under the worst conditions, it is said to limit mud to a thin top layer. Cost of application, including material and labor, is about 33¢ a square yard.

X. CHEMICAL DOLLARS

At current prices and dividend rates, chemicals offer a modest return on invested dollars. Reasons for buying chemical stocks may be as numerous as the individuals who buy them, but the common denominators include these arguments:

• **Customer List**—A chemical manufacturer has a wide diversity of products, and a relatively small area of direct competition with the products of other companies. Chemicals sell not only to the capital goods industries, like iron and steel, but also to the consumer industries like food and clothing, and to each other.

Chemical production follows rather closely the trend of all manufacturing activity, but it has more resistance to extreme, rapid fluctuations caused by depressions, by changing public tastes, or by style trends.

• **"Relentless Growth Trend"**—As a group, chemicals exhibit what Dr. Roland P. Soule, a chemical engineer and investment consultant, calls a steady relentless trend of growth. Textiles provide one example. Chemicals began to serve textiles in the making of dyestuffs. Now there are not only chemical dyes, but also chemical finishing and processing agents, and chemical fibers that have moved into the markets for natural fibers, meanwhile creating new markets of their own.

Discussing this trend, Dr. Soule observes that it seems to promise, eventually, important industrial weddings, as of textiles and plastics, fibers and plastics, plywood and stainless steel, and, from such combinations, an impetus for the future development of some of the less sprightly industries, such as textiles and building materials.

• **Research Investment**—The investing public seems to approve the chemical companies' heavy outlays for research, from 15 to 20 times as much, in proportion to sales volume, as the average U. S. manufacturer pays for research.

One modifying factor is that successful research always benefits the consuming public, but not necessarily the stockholder. Every producer has to consider that improvement through research, his own and his competitors', may mean lower unit prices, consequently diminishing returns on long-established products. It is significant that most chemical companies stress the kind of research that results in new products, over the kind that merely aims to maintain existing standards or extend the usefulness of existing products. They are reaching out for new methods, new products, and new markets.

• **War Impetus**—Although the first American chemical company was founded over 300 years ago (by John Winthrop, Jr., in 1635), chemicals didn't begin to be important to this country, industrially, until after the first World War began about 30 years ago. There is no indication that chemicals' long-term growth is approaching the end of its cycle, despite the feeling that total output probably will be cut down at the end of this war.

Defining the chemical industry in its limited sense, without "allied products" or "chemical process industries," U. S. production in 1939 totaled about $790,000,000, according to Bureau of Census figures. This was less than the 1939 gross sales of Standard Oil Co. (N. J.) or U. S. Steel, both of which exceeded $900,000,000, and only about 60% of the 1939 gross sales of General Motors.

• **Five Years Later**—In 1944, according to unofficial estimates, chemicals production, under the same limited definition, will approximate $2,325,000,000, exceeding that of Standard Oil or U. S. Steel, but more than $1,000,000,000 under that of General Motors.

If chemicals production is taken to include allied products such as rayon, cellophane, nylon, paints, varnishes, lacquers, plastics and plastic products, drugs, cosmetics, fertilizers, glass, naval stores, insecticides, soap and glycerin, and printing inks, the total this year is estimated at approximately $8,000,000,000. This does not include military explosives, on which no estimates are available.

Relatively speaking, then, chemicals constitute a small industry, yet its earnings are topped only by those of the petroleum, stone-clay-glass, and automobile groups.

• **Highest Market Value**—The market value of chemical stocks listed on the New York Stock Exchange tops the market value of all other groups. In a statement based on Oct. 31 values, chemicals' market value totaled $6,33[illegible] 262,764, according to exchange tabulations. Next in line were petroleum, $6,045,812,783; automobiles, $4,63[illegible] 260,369; railroads, $4,226,556,25[illegible] communications, $3,912,039,958; and food, $3,481,760,483. Retail merchandising was just below $3,000,000,000; no other group was above that figure.

• **From Other Fields**—From another point of view, chemicals constantly get new competition from their customers in other industries. Chemical companies traditionally don't go out of their way to compete directly with each other in the same markets, but one nonchemical manufacturer after another has been exploring the possibilities of producing his own basic chemicals, and of converting waste into useful chemical products.

The big oil companies are making butadiene, styrene, alcohols, and an impressive new group of chemical intermediates, many of them in tank-car quantities. Rubber companies, of necessity, have become large chemical producers, and they have been expanding into plastics and other lines.

Rather than fight against this trend, the old-line chemical companies probably will expand their tonnage markets by continuing to develop new products of their own, and by promoting more combinations of their established products with other materials.

• **Double Role**—Large manufacturers seem to be placing increased emphasis on a functional combination of the various technologies, chemistry, engineering in its various branches, physics and dynamics, into one all-inclusive technology, "functional engineering" which aims at efficient and profitable service to the ultimate consumer, rather than toward the extension of markets for any one product or material.

To accelerate the existing tendency toward industrial change, the chemical may play a double role: as catalyst, promoting the transformation of old materials into new, and as solvents, dissolving and fusing into their own the elements of various other industries.

REPRINTS AVAILABLE

Copies of this Report to Executives will be available in reprint form. Single copies will be mailed to Business Week readers upon request without charge. Additional copies will be billed at the rate of 20¢ apiece. On orders of eleven or more, quantity prices will be quoted. Orders should be addressed to Willard Chevalier, Publisher, Business Week, 330 West 42nd St., New York 18, N. Y. If checks are sent, they should be made payable to Business Week.

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Out of the coastal lowlands of the Gulf South go hundreds of millions of pounds of rice annually . . . in Lend-Lease shipments to help fill the dinner plates of the hungry peoples. Basic crop of this prosperous region, rice stands No. 1 among all mankind's foods in quantity consumed. That, plus availability of Natural Gas fuel and trained, loyal workmen, is a challenge to incoming food industries when the war is won and the Gulf South Cradle of Victory is again the Land of Industrial Opportunity.

THE *Gulf South*

ITS RESOURCES, ITS MANPOWER,
ITS PRODUCTION ARE ALL
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UNITED GAS PIPE LINE COMPANY: A Natural Gas transmission company dedicated to serve wartime fuel requirements throughout the Gulf South. FOR TEXAS—Mail received at Beaumont, Dallas, Fort Worth, Houston, Longview, San Antonio and Wichita Falls. FOR LOUISIANA—Mail received at Baton Rouge, Lake Charles, Monroe, New Orleans and Shreveport. FOR MISSISSIPPI, ALABAMA and FLORIDA—Mail received at Jackson, Miss.

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All phases of GAS and ELECTRIC UTILITY MANAGEMENT, CONSTRUCTION and APPRAISAL....

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Speed Sweep
WITH A BACK OF STEEL

Makes Light Work
Out of Tough Sweeping Jobs

Steel back of Speed Sweep brushes is the basis of unique construction for faster, easier, better sweeping. Block is ⅓ usual size – easier to handle. Tufts of longer, better fibres are more compact – provide "spring and snap" action. Handle instantly adjustable to height of sweeper – reduces fatigue and strain. Speed Sweep brushes are built to outlast ordinary brushes 3 to 1.

FULLY GUARANTEED

Since Pearl Harbor Speed Sweep brushes have proved their superiority in many thousands of factories under varied conditions. They are unconditionally guaranteed to meet your requirements. Prompt shipment on AA-5 or higher priority rating. Write for styles, sizes, and prices today.

Milwaukee Dustless
BRUSH COMPANY
534 N. 22nd St. Milwaukee 3, Wis.

MARKETING

Unique Survey

Commerce Dept. and private research agency check drugstore sales. Government's estimates are found accurate.

Collaboration between the Commerce Dept.'s Bureau of Foreign & Domestic Commerce and A. C. Nielsen Co., private market research agency, has resulted in detailed information on the wartime sales performance of drugstores.

• **All Stores Checked**—By using files of the Treasury Dept.'s Bureau of Narcotics—which maintains a registry of all U. S. drugstores—Commerce and Nielsen were able to get an intercensal sales record, broken down by regions, by city sizes, and by size and type of store (chain or independent).

Commerce will use the survey as a check on its regular estimate of retail sales, derived by sampling and by weighting of total sales reports from sales-tax states. The survey has obvious benefits for Nielsen which is best known for its long-established food and drug indexes.

• **Will Be Revised**—The sample from which Nielsen's drug index is derived must be periodically revised to conform to changes in total sales patterns. The current survey will form the basis for such a revision, which otherwise would have to wait until the time for another over-all census of distribution (the last of these was held in 1939).

The Commerce Dept. takes a bow on the narrow discrepancy between its previous estimate of 1943 drugstore sales and that derived by the new survey. Commerce's regular estimate placed 1943 sales at $2,746,000,000.

• **Same for Chains**—The survey corrects this to what Commerce considers the more accurate figure of $2,588,000,000. Both estimates give the same results for chain store sales—$654,000,000. The difference lies in a lowering of the estimate for independent sales.

Commerce's preliminary estimate of 1944 drugstore sales, using its regular techniques, is $2,900,000,000. By the new method, it is $2,800,000,000.

• **Independents Gain More**—The survey shows that chain store outlets accounted for 25.4% of total drugstore

THE WORST OF ALL!

Last week the cigarette shortage reached headline proportions as supplies in some sections neared the vanishing point. In a Chicago store a counter placard in eight languages (above left) typified the shortage, and in New York, Herman Oriel (above-right) was overjoyed to bid in—at OPA price ceilings—876 cartons at a state tax sale. He cheerfully explained that he would lose $50 in handling expenses, cheap customer goodwill insurance under the circumstances. At a postoffice auction—without ceiling—in Chicago, a Walgreen chain buyer paid about 41¢ a pack for 218 cartons, but publicity dividends outweighed merchandising loss. Walgreen's big sale, plus the stunt of moving the stock by armored truck, kept the chain's name in every edition of most Chicago papers for three days.

DRYING PENICILLIN 48 TIMES FASTER BY ELECTRONIC HEAT

RCA System Reduces Production Time; Saves Factory Space; Cuts Cost

At a time when penicillin is needed fast, RCA engineers have developed a new electronic system for the bulk reduction of purified penicillin solution. Conventional "freeze drying" takes 24 hours to perform this step; the new RCA method does it in 30 minutes—48 times faster!

E. R. Squibb and Sons, manufacturing chemists to the medical profession, worked closely with RCA in developing the new process. The initial RCA 2000-watt electronic generator and associated equipment (shown at right) at the Squibb penicillin plant, New Brunswick, N. J., can concentrate in 24 hours enough penicillin solution to treat 4,000 patients requiring 500,000 Oxford units each.

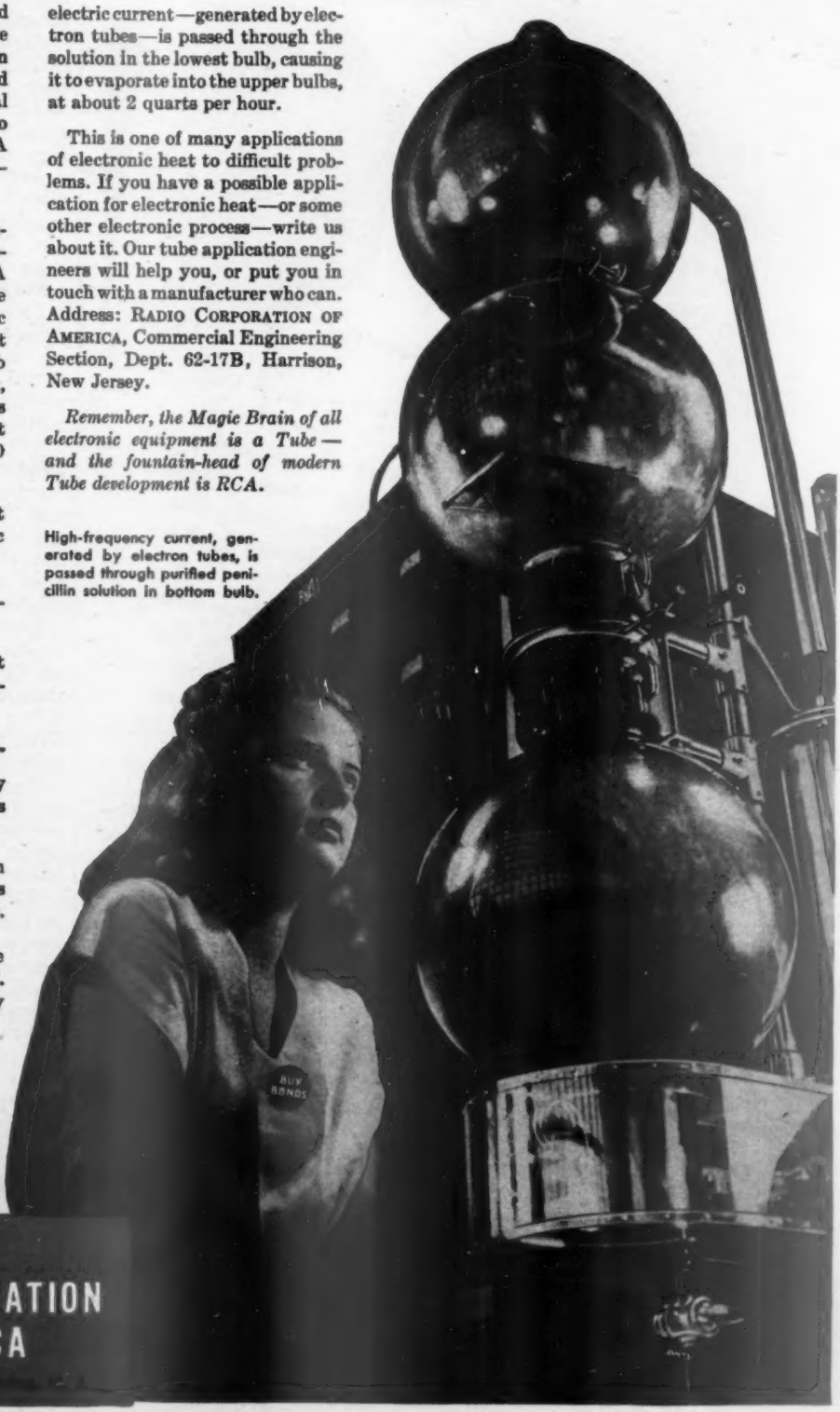
Squibb scientists disclosed that additional advantages of electronic heat include:

1. Savings of one ton of dry ice—$65—per day.
2. Large savings in initial plant investment compared with former process.
3. Reduction of floor space by 90%.
4. Reduction of maintenance by eliminating freezing apparatus and high-vacuum pumps.
5. Smoother flow of production with less chance of shut-downs due to mechanical difficulties.

Electronic heat is used to "boil" the purified penicillin solution at 50° F. at low pressure. High-frequency electric current—generated by electron tubes—is passed through the solution in the lowest bulb, causing it to evaporate into the upper bulbs, at about 2 quarts per hour.

This is one of many applications of electronic heat to difficult problems. If you have a possible application for electronic heat—or some other electronic process—write us about it. Our tube application engineers will help you, or put you in touch with a manufacturer who can. Address: RADIO CORPORATION OF AMERICA, Commercial Engineering Section, Dept. 62-17B, Harrison, New Jersey.

Remember, the Magic Brain of all electronic equipment is a Tube—and the fountain-head of modern Tube development is RCA.



High-frequency current, generated by electron tubes, is passed through purified penicillin solution in bottom bulb.

RCA

RADIO CORPORATION OF AMERICA

THIS FILTER
baffles THE
"rain makers"
IN YOUR PLANT
... Another example of Air-Maze engineering
In many industrial processes where water sprays are used, tiny droplets become a part of the air stream. Usually, this is undesirable since water cannot be exhausted to atmosphere without causing deterioration of machines and materials or interfering with production or processing. For these applications Air-Maze has developed filters that let air pass but capture the water droplets.
You may never need a filter to eliminate "man-made rain", but you can obtain the same advantages of engineered air filtration in every Air-Maze air filter. Whether you are interested in air conditioning, ventilating, compressors, blowers or engines, remember—"if it uses air, use Air-Maze".
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AIR-MAZE
ENGINEERED AIR FILTRATION

sales in 1943, a small decline from the 1939 figure of 25.6%. But, on the average, the gain in sales per store during the war-boom years was much smaller for chains than for independents (box, page 93). This is partly accounted for by the much heavier mortality among independents and by the fact that the average independent, being only one-fourth as large as the average chain outlet, had more room to grow in.

Average 1943 sales per store for all chain outlets were significantly higher than the sales of just those outlets which were in business continuously from 1939 through 1943. This indicates that, with wartime shortages of materials and manpower, the chains carefully placed new outlets in locations calculated to bring in the biggest revenue. Independents, likewise, showed heavy sales gains for new stores.

• **Skimming the Cream**—Even during a period when more drugstores were dying than were being born, there was an increase in the number of chain outlets in those areas of the country which were skimming the cream of the wartime sales boom.

There was a jump of 7.1% in the number of chain store outlets in the Southeast (where total drugstore sales rose 77% between 1939 and 1943 and where chain sales race 100%). Chains increased their outlets in the Southwest and the east central states, also regions with heavy sales gains.

On the Pacific Coast, however, which experienced the biggest sales gain of all—94%—there was a small decline in the number of chain outlets.

• **New York, Chicago Lag**—By contrast, the pattern of mortality among independents shows little correlation with regional sales gains. Both chains and independents closed many doors in metropolitan New York and Chicago where sales gains lagged behind the rest of the country.

The largest sales gains were chalked up by the smallest independents in the smallest towns. Independents in medium-sized cities (50,000 to 500,000 population) fared better, however, than those in small cities (5,000 to 50,000 population). With New York and Chicago counted out, both independents and chains made the best showing in metropolitan cities. While the smallest independents gained most, the reverse was true of the chains.

• **Net Decline**—While total drugstore sales were 66% higher in 1943 than in 1939, wartime attrition resulted in a net decline of 4,037 individual stores during this period (5,238 deaths, minus 1,201 births).

Over 88% of the net closings were of the smallest stores (less than $20,000 annual volume)—and virtually all

Drugstore Sales Spiral During War

The Commerce-Nielsen drugstore survey shows that while sales per store have climbed steeply during the war for both chains and independents, the increase has been markedly greater for independents than for chains:

Average Sales of Drugstores

	1939*	1943*	% Increase 1939-43
All chain drugstores...	97	160	65
Chains in business continually, 1939-43	99	157	59
All independent drugstores	22	39	77
Independents in business continually, 1939-43	23	39	70

* *Thousands of dollars.*

Wartime sales performances of both chains and independents show interesting regional variations:

Sales of Retail Drugstores by Regions
% Increase, 1939-1943

	Total	Chain	Independent
U. S.	66	64	66
New England	58	62	57
Metropolitan New York	39	26	42
Middle Atlantic.....	57	57	56
East Central.....	72	71	72
Metropolitan Chicago.	43	33	49
West Central.....	59	53	61
Southeast	77	100	73
Southwest	73	73	73
Pacific	94	83	98

The regional sales performance is partially explained by the vital statistics which show the net change in the number of individual chain and independent stores during the war years:

Number of Drugstores by Regions
% Change 1939-43

	Chain	Independent
U. S., total.....	—0.6	—7.5
New England.....	0.6	—8.0
Metropolitan New York	—9.7	—8.0
Middle Atlantic.....	—1.7	—5.8
East Central.....	0.6	—5.8
Metropolitan Chicago.	—8.5	—12.3
West Central.....	—1.1	—7.6
Southeast	7.1	—8.0
Southwest	5.2	—6.9
Pacific	—0.5	—9.0

The rate of sales gains for both chains and independents shows significant variations by size of city, and by size of store:

% Increase 1939-43 in Average Sales per Store by Size of City

	Independents	Chains
Under 5,000.....	87	..
5,000-49,999	79	65
50,000-499,999	81	66
500,000 and over.....	73	63
500,000 and over, excluding New York and Chicago.	87	72

Sales by Size of Store
% Increase, 1939-43

	Average Sales	Total Sales
Independents		
Under $20,000.....	100	70
$20,000-$50,000 ...	77	69
Over $50,000.....	58	57
Chains		
Under $100,000....	59	53
Over $100,000.....	61	70

of these were independents. Since these accounted for 58% of all stores, numerically, in 1939, the heavy increases in sales per store for the smallest independents obviously are affected by the mortality statistics.

• **Narcotics Bureau Aids**—Commerce and Nielsen obtained from the Narcotics Bureau the names of all drugstores which have gone out of business since 1939, and the sales of these were deducted from total drugstore sales as reported in the 1939 census.

Sales of stores continuously in business from 1939 through 1943 were then obtained through a sample of 4,000 stores. In addition to the Census Bureau's regular monthly sample of 1,480 independent stores, Nielsen sampled 1,000 independents and 1,500 individual chain store outlets.

Stores entering business since 1939 were covered by a blanket questionnaire on which the survey drew a 53% response, which was weighted to give total sales.

• **Unusual Tie-Up**—Collaboration of the type found in this survey between a government agency and a private business is unusual, and the joint project probably will be counted a feather in Nielsen's cap. Nielsen and Commerce are exploiting the results of the survey jointly.

A detailed report of their findings may be had by writing to the Bureau of Foreign & Domestic Commerce, Washington 25, D. C., or A. C. Nielsen Co., 2101 Howard St., Chicago, Ill.

TIRE MARKETING TIE-UP

Sinclair Refining Co. and the Goodyear Tire & Rubber Co. have announced an agreement whereby Sinclair filling stations (9,800 before the war) will market Goodyear tires, tubes, batteries, and other accessories. Obvious advantage, in addition to mass volume sales, is the leverage this will give Goodyear in competition with private brand tires, which claimed 34% of the total renewal business in 1941.

Goodyear has prepared sample display units to assist the filling station operator

PACKAGER CUTS COSTS 50%

PACKAGERS all over the country are finding that paper bags, *if closed by the Union Special DUBL-TAPE Sewed Closure*, make ideal consumer packages for everything from dog food to coffee. Attractive appearance, ease of opening and security of closure are liked by consumer and retailer. The low cost of producing the closure with Union Special sewing heads, high output and ease of operation put this method in a class by itself. One user reports cutting his packing costs 50%!

It's worth looking into. Write today.

NEW BULLETIN NO. 100

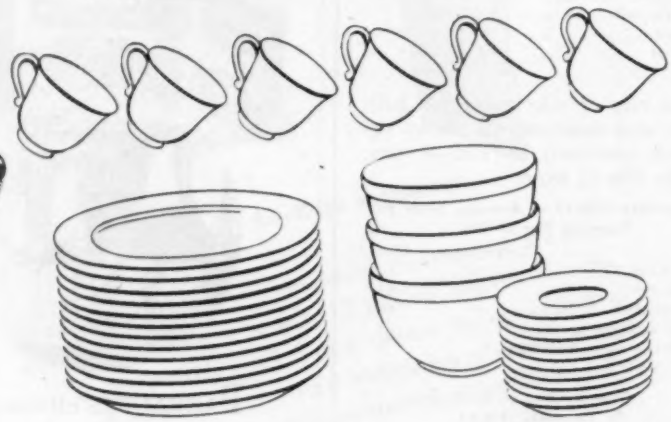
Describes the Dubl-Tape closure and machine for producing it. Includes installation photos and reports of users. Ask for a copy.

Union Special Machine Company

408 N. Franklin St. • Chicago 10, Illinois
Sales and Service All Over the World

WANTED... A SEMI-PORCELAIN DINNERWARE MANUFACTURER...

To LOCATE a PLANT IN NORTH CAROLINA to SERVE the SOUTHEASTERN STATES



POTENTIAL MARKET: Thousands of tons of finished ware a year with the demand growing.

MANUFACTURING AND DISTRIBUTION COSTS: Substantial savings, placing such a manufacturer in a most advantageous competitive position, are indicated.

RAW MATERIALS: North Carolina leads America in the production of primary kaolin and feldspar. High grade quartz (it was selected because of its superior quality for the manufacture of the world's largest observatory telescope lens) is abundant in North Carolina.

LABOR: North Carolina labor is noted for its adaptability. Typical of the experience of manufacturers who have moved their plants to North Carolina is that of the newcomer who wrote, "*It was necessary for us to employ inexperienced people and train them. We found that these people were easily trained and showed a high degree of enthusiasm and interest in their work. They have proved to be efficient workmen, steady and reliable. We have had practically no absentee problem. All our workers are exceptionally loyal and vitally interested in the welfare of our company and organization.*"

TAXES: A sound and stable tax structure.

TRANSPORTATION: Raw materials are close by. The entire Southeastern area is adequately served, by rail and truck, from North Carolina. Substantial savings in freight will be reflected in distribution costs.

Write today for information on the potentialities of dinnerware manufacture in North Carolina. Address Commerce and Industry Division, 3254 Department of Conservation and Development, Raleigh, North Carolina.

NORTH CAROLINA

in merchandising the accessories, which it is hoped will comprise 10% or more of his total business.

The 166,000 filling stations (and about the same number of other gasoline outlets) which have remained in business have learned about merchandising a variety of goods during the war (BW—Jan.1'44,p88).

CITY STORES EXPANDS

Purchase of R. H. White Co., Boston department store, from William Filene's Sons Co. was announced this week by City Stores Co., in "a cash transaction involving many millions of dollars." The deal is subject to approval by Filene stockholders on Dec. 10. City Stores, which has units in Philadelphia, New Orleans, Memphis, Louisville, and Birmingham, announced that addition of the Boston store would increase their estimated total sales volume from $80,000,000 to $90,000,000 a year.

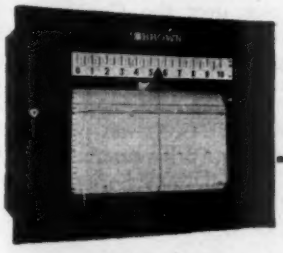
AND NO FOOT IN THE DOOR

Vacuum cleaners, produced under War Production Board spot authorizations, went back on the market last week under the spotlight of publicity. In Cleveland, Walter Voight (right), United Vacuum Cleaner Stores' general manager, got credit in afternoon editions for the first cleaner delivery since March, 1943. Morning papers recognized the claim of New York's Electrolux Corp., which raced to fill the order of another Cleveland housewife. The two companies are among eight with WPB permits to manufacture vacuum cleaners.

IN ICEBOATING . . . IN PROCESS CONTROL

A NEW PRINCIPLE IN INSTRUMENTATION

BROWN ElectroniK POTENTIOMETER



OPERATES ON "CONTINUOUS BALANCE" PRINCIPLE

With sails filled, — racing over the ice at lightning speed, — no need to emphasize the need for "continuous balance" here!

Manufacturing processes responsible for meeting the demands of the war effort require the same instantaneous corrective action at the first sign of process unbalance.

The Brown ElectroniK Potentiometer, operating on the "continuous balance" electronic principle, brings to industry the ability to detect and then correct, in split-second time, any loss of balance in temperature processing, be the product high-octane gasoline, food stuffs or one of the chemical marvels of the post-war world.

Tomorrow's reconversion will pose many a problem for the busy executive. Let a Brown engineer tell you where the Brown ElectroniK can help, if temperature measurement or control is involved. Offices in most industrial centers, — just pick up the telephone. The Brown Instrument Company, a division of Minneapolis-Honeywell Regulator Company, 4525 Wayne Ave., Philadelphia 44, Pennsylvania.

LISTEN . . . The Blue Jacket Choir with Danny O'Neil; every Sunday 11:05 to 11:30 A. M., Eastern War Time, C. B. S.

INSTRUMENTS BY **BROWN** CONTROLS BY

MINNEAPOLIS **Honeywell**

FINANCE (THE MARKETS—PAGE 126)

Empire Builder II

Great Northern's plan for streamliner to Seattle is a bold bid for traffic which Milwaukee and N.P. are expected to match.

Great Northern Ry., recently looming large in Wall Street news and comment because of its successful $100,000,000 refinancing program, presently the subject of conjecture over the possibility of increasing its dividend rate from $2 a year, hit the news columns again last week with announcement it will be the first northern transcontinental line to offer Chicago-Seattle streamliner passenger service (BW—Nov.18'44,p10).

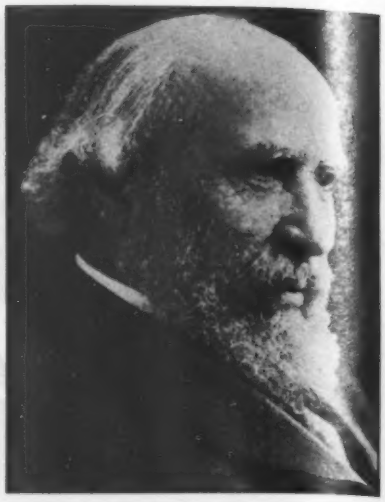
• **Save Half a Day**—Still a year or more from fruition, the new program will cost $7,000,000 for five new trains, cut to 45 hr. the present running time of 58 hr., 45 min., over the 2,192-mile route from Chicago to Seattle—a time saving of more than half a day.

Thus the Great Northern appears to have taken a long lead over its two competitors, the Chicago, Milwaukee, St. Paul & Pacific and the Northern Pacific, for rail passenger traffic traveling to and from the Pacific Northwest.

• **Others to Follow?**—That the other two will follow suit appears inevitable. The Northern Pacific, "related" to the Great Northern through their joint ownership of the Burlington Lines, is known to have plans under way for similar service. The Milwaukee road thus far has remained mum.

Geared to run as high as 90 m.p.h., the new streamliner will be powered by 4,000-hp. diesel-electrics of the Electro-Motive Corp. The eleven-car trains, to be built by Pullman-Standard, will accommodate 300 persons, have a baggage-mail car, four ultramodern coaches, grill-buffet car, dining car, three sleepers with all types of accommodations, and observation-lounge car. Innovation will be four-wheel trucks on cars in place of the conventional six. Total weight will be 624 tons against 809 for present train of same capacity. The trains will be built as soon as materials are released by WPB.

• **Empire Builder**—The new train will bear the same name as the line's present crack transcontinental train—Empire Builder—after the title long held by the fabulous James Jerome Hill, the road's founder, one-time joint owner with J. P. Morgan of the Northern Pacific, and the man who, with Morgan, brought the Burlington under joint G. N. & N. P. ownership in a wild stock market fight against Edward H. Harriman of the Union Pacific.



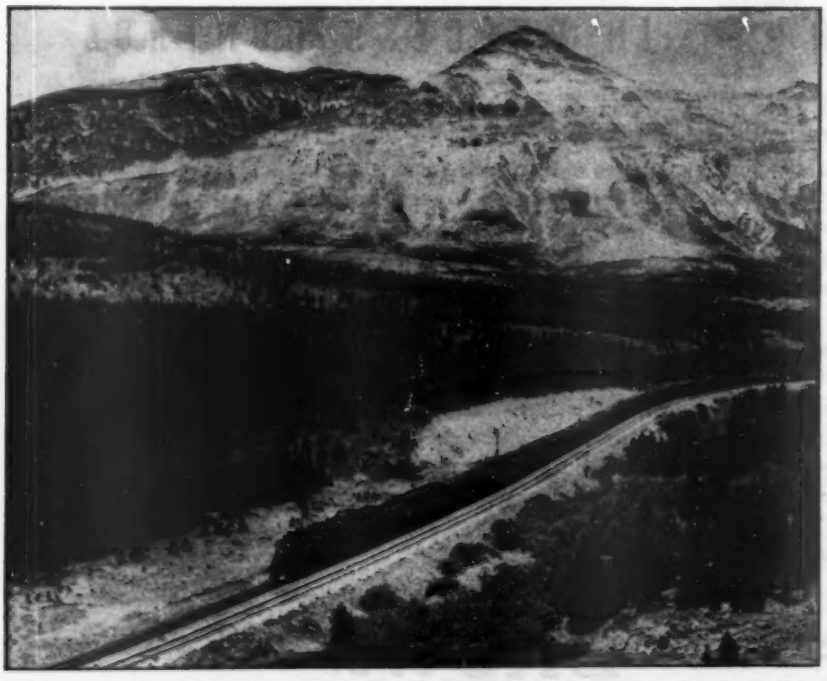
James J. Hill founded the Great Northern Ry., provided it with the easiest route to the Pacific Northwest, and christened its best-known train.

While this is not the first time that plans for fast Chicago-Seattle rail service have been broached, it does mark one of the first instances in which the three northern transcontinentals (No. 1, No. 2, No. 3 on map, page 98) have failed to collaborate.

• **Same Run, Same Time**—One evidence of collaboration is that the three roads' crack trains make the Chicago-Seattle run in the same elapsed time, even though the N.P. route is 140 mi. longer than those of the other two. (Mitigating factor here is that the two shorter lines cannot set up schedules to take advantage of mileage savings; to do so would be to land their crack trains at destination before dawn, when passengers wouldn't want to get off anyhow. In order to arrive in Seattle on the morning of the third day, all three roads have trains leaving Chicago at night—the G.N. and the Milwaukee using Burlington tracks as far as the Twin Cities, their eastern terminuses. The 140-mi. saving, however, may count heavily when streamliners are cutting half a day's time from schedules.)

Several years ago it was reported that Great Northern, which also has the lowest pass over the Continental Divide north of the Southern Pacific's crossing, was planning to reduce its running time about seven hours. Railroad men will give no confirmation, but it is presumed that G.N. was persuaded to drop the plan. Why, no one will say.

• **Pool Idea Dropped**—Another plan, originating in Seattle, called for a pool service. G.N. would handle a new spe-



Great Northern's Empire Builder rolls through Marias pass, lowest rail crossing of the Continental Divide and potential time-saver for streamliner schedules.

It's a great organization to work for"

The statement, "It's a great organization to work for" is a dividend-paying statement.

It's a statement which attracts the best talent; the competent workmen; the ambitious young men.

There are many reasons for this commendation. Among them is not only consideration for the present welfare of employees, but also consideration for their future welfare.

A pension plan helps to instill in employees the feeling: "This is a great organization to work for." Older employees, certain of the future because of the combined benefits of pensions and social security, work with full energy up to their retirement. Younger employees, seeing opportunities ahead for advancement, put their best efforts into their jobs. Your organization stays young in years. But what is more important, it stays young in spirit.

In setting up a pension plan, the John Hancock Company offers you within certain limits the privilege of purchasing either individual policies or group annuities. It also places at your disposal the benefit of its eighty years experience in keeping promises through all of life's uncertainties—an experience which includes periods of prosperity and depression and all sorts of unexpected events.

In the preparation of proposals we would be glad to work in conjunction with the trust officer of your bank, if you wish. For further information, get in touch with the John Hancock agent in your locality, or write to the Home Office of this Company.

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MUTUAL
LIFE INSURANCE COMPANY
OF BOSTON, MASSACHUSETTS
GUY W. COX, President

cial train from Seattle to Spokane, the Milwaukee from Spokane to Sappington, Mont., N.P. from there to Fargo, N. D., G.N. again from Fargo to St. Paul, and the Milwaukee the rest of the way into Chicago.

The route would cut 50 mi. from the shortest one-line route, and would hit most of the major cities served by any of them. But the G.N. and the N.P., particularly, were cool to the idea, for it meant that the Milwaukee would be handling the run over the heaviest traffic section between Chicago and the Twin Cities—which might affect prestige, if nothing else. It wasn shortest possible route, nor wa mileage equally divided. Nothing of the idea.

Another plan—born, no doub depression-curtailed rail travel—wa

War freight today is moving toward the West Coast in the largest quantity in history, and with the end of the European war the volume is certain to be stepped up still further. Goods bound from the Middle West to the Pacific can travel by a variety of routes, of which the major ones are shown above. For instance, it can cover the whole distance from Chicago on the Santa Fe (6), or it can go as far as Denver on the Burlington (9), to Salt Lake City on the Rio Grande (5), and the rest of the way via Western Pacific (8). Again, it might move via the Milwaukee (2), on a single through route, or on a split route to Tucumcari, N. M., on the Rock Island (11), from there by Southern Pacific (7). But on any routing it must pass over one of just seven lines across the Rockies (white section on map), and every one of seven has stretches of single track ro Partial easing of this bottleneck been accomplished by coordination freight routing for all roads throu one office (BW—Dec.11'43,p29) by the use of centralized traffic con (BW—Nov.11'44,p42). But even m energetic steps must be taken if freig for a full-scale war against Japan is be handled successfully.

"The greatest service... to the greatest number"

By **C. BEDELL MONRO** *President, PENNSYLVANIA-CENTRAL AIRLINES*

PCA is proud to have been a pioneer in a phase of commercial aviation on which tomorrow's concept of air transportation is predicted: a concept recognizing that aviation can grow and offer its greatest public service as it begins to serve the greatest number of people.

In that peaceful postwar era for which so many Americans are already planning, we shall see the dawn of a new transportation age, in which the airplane will bring new, vastly improved services and dozens of new travel comforts to those sections of our country where the greater part of our people live and have need for them. To the furtherance of this program of service, our Company is dedicated.

READY: Tomorrow's airliners will have AiResearch "comfort-protection"

IN TODAY'S great headline-maker, the B-29 Superfortress, there's good news for peacetime air travel. It's news of the smoother, faster route she flies — high through the substratosphere.

The B-29's *pressurized cabin*, which makes it possible to fly at great altitudes through thin sub-zero air, is tomorrow's *AiResearch "comfort-protected" cabin.*

Many postwar airliners will have the same devices perfected by AiResearch to seal a "low altitude" inside a cabin. These will keep you in constant comfort — from airport to airport — even when your plane flies 35,000 feet high or more!

Also for your comfort, there will be AiResearch control systems to provide "just-right" warmth and to keep the cabin free of smoke and odor.

AiResearch has still other wonder-working devices in store for you: ways to harness air, pressure and temperature for easier, more pleasant living at home and work. AiResearch Manufacturing Company, Los Angeles and Phoenix.

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ARMY E NAVY

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Supercharger Aftercooling Systems • Engine Air Intercooling Systems
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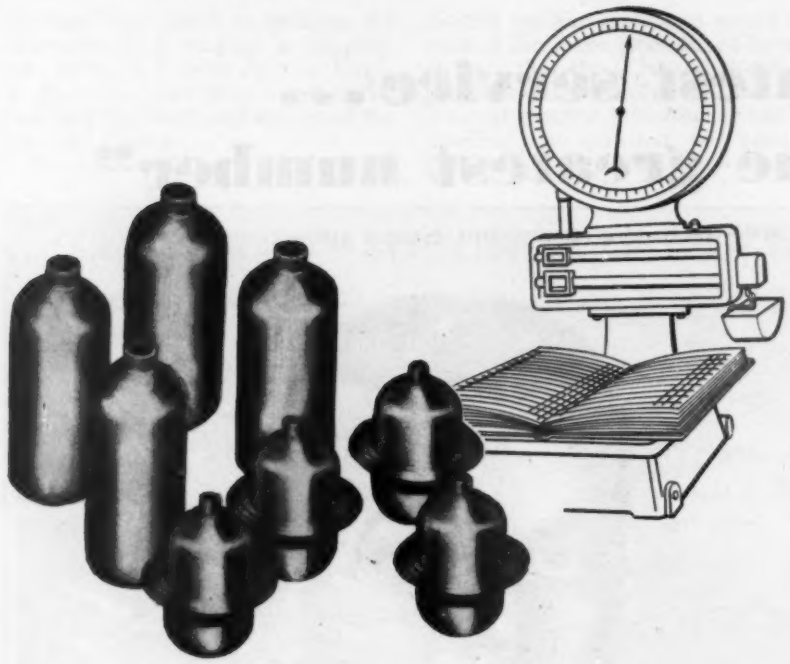

LIGHT WEIGHT—

CAN IT REDUCE COSTS FOR YOU?

Light weight with its important economies is one result of Pressed Steel Tank Company's more than 40 years of working with numerous metals. This experience, together with volume manufacturing, assures the production of better products—products that last longer and reduce costs.

• Pressed Steel Tank Company's 40-year-old experience is now being successfully applied in the production of seamless shells and shapes made from many of the recently developed high-strength alloys.

By forming the shapes thru cold-drawing, considerable savings are made in time, money and material. The Hackney process consists of cupping from flat circular sheets or plates; cold-drawing to obtain the desired diameter and wall thickness. The finished products are heat-treated to assure the desired physical characteristics. Shells and shapes have been made with capacities as small as 1 quart and as large as 110 gallons.

As a result of cold-drawing, many important war products have either been decreased in over-all weight, made stronger, improved in appearance, produced in faster time or have been assured of greater durability. Often there has been a combination of these and other vital advantages.

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CONTAINERS FOR GASES, LIQUIDS AND SOLIDS

WHY MERGER FLOPPED

Jim Hill's empire-building propensities lived on in the railroads he created or controlled long after his death in 1916.

In 1927 managements of the Great Northern and the Northern Pacific proposed to merge into the Great Northern Pacific. With their control of the Burlington and the Spokane, Portland & Seattle Ry., this would have formed a 27,000-mile system, longest in the world.

But tremendous opposition arose from shippers, from the states served by the carriers, from other railroads. After two years' work, the Interstate Commerce Commission approved the plan, but with certain provisos, chief of which was that the combined system drop the Burlington. The two roads decided they couldn't comply with the ICC conditions, and the plan was dropped in 1931.

the roads to rotate a fast schedule, ea running such a train two days a wee What to do on the seventh day was poser. This idea was soon abandone

• Going It Alone—This time, Gre Northern is setting out alone, it wou seem. And many of the advantages which it can capitalize can be trac back to Jim Hill, who pushed its trac across the Great Plains states, throug and over the Rockies and Cascades the Pacific.

The N.P. had been built ten yea when Hill completed his job in 189 But he, through a lucky break, deve oped a shorter, easier route.

• Hidden Pass—In 1889 Hill sent Joh F. Stevens, Great Northern enginee into the Rocky Mountains to lay ou a route over the Continental Divid Stevens learned of a Blackfoot India legend concerning a hidden pass whic if it existed, would avoid turning th railroad southward to cross the Divid

The Blackfoot would not guide hi fearing evil spirits. So Stevens set o early in the winter from Havre, Mont with a Flathead Indian guide. Th guide, according to the legend, sudden turned ill, but Stevens went on. H followed three false passes, but final reached a wide valley little resemblin a mountain pass and found himse looking westward over lower mounta ranges. He had found the legenda pass.

A blizzard nearly prevented his re turning with the news, but he tramped in a circle all night and kept from freezing. A statue of Stevens in Mari

ass on the southern boundary of Glacier National Park, beside the G.N. tracks, now marks the spot of his discovery. Stevens later was chief engineer and general manager of the road.

• **Mile-High Pass**—Result of his discovery is that the Great Northern's highest point is 5,213 ft. above sea level. Northern Pacific must climb to 6,256 ft., Milwaukee to 6,347 ft.

Not far west of Marias pass, in Belton canyon, Great Northern is completing a $1,500,000 rail-line rebuilding and tunneling job which climaxes several years' work in eliminating curves and reducing grades—all of which will aid its streamliners.

• **N.P.'s Improvements**—Northern Pacific is undertaking similar work, spending $1,250,000 for a tunnel near Bozeman, Mont., $750,000 to straighten curves, $2,500,000 on ballast, and $1,500,000 on a locomotive shop at Livingston, Mont.

And pointing further toward substantiating conjectures that it, too, will launch a streamliner, is the just-completed trip over the line made by the full board of directors.

• **Balm in Old Wound**—Seattle likes the idea of all three roads putting in streamliner service. It would give the city more speed trains than San Francisco, its competitor down the coast.

The Great Northern's announcement helps ease the hurt that Jim Hill once gave Seattle when he brought his line to Puget Sound at Everett, 33 miles north, planning to make that the jumping-off point for an ocean route to the Orient. At Everett, too, he tapped the vast lumbering territory and fishing industry along the sound. Hill did develop a steamship line to Japan and China, but it was separate from his Great Northern rail interests.

• **Passenger Traffic Soars**—Great Northern's passenger traffic has grown tremendously in the past four years, as has that of the other two northern transcontinentals. Its 1941 patronage was 12.36% over 1940; 1942 was 54.03% over 1941; 1943 was 63.20% over 1942; and the first half of 1944 was 13.36% over the first half of 1943.

Wiseacres see the streamliner announcement as a calculated move to hold on to a lion's share of the passenger business when war-stimulated travel begins to abate.

S.P. UPS DIVIDEND

The 75¢ mid-December dividend authorized by Southern Pacific Co.'s directors confirms Wall Street predictions (BW—Oct.28'44,p69) that the road's 1944 distribution to stockholders would reach $2.50 a share, compared with 1943's $2 and the 1942 $1 token-

WE CAN *Tool Now* FOR YOUR
ERIE RESISTOR
Custom Molded
PLASTIC PRODUCTS

IT is now possible to design and build molds for postwar plastic parts. While production of Erie Resistor Custom Molded Plastic articles for peacetime applications is limited, alert companies are now placing orders for postwar items, so that molds will be ready to run at full capacity when production restrictions are lifted.

Combining dimensional accuracy with beauty and color, Erie Resistor's vast experience in the handling of intricate multi-cavity or cam-action molds guarantees customer satisfaction.

Our new bulletin contains a comprehensive outline of our experience and facilities for engineering, molding, and finishing custom molded plastics. Write for your copy.

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★ ★ Do More Than Before—Buy EXTRA War Bonds ★ ★

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the "lifestream" of
INDUSTRY

Wherever the wheels of industry turn, there must be power. With the modern trend toward higher and higher temperatures and pressures in power lines, new demands are continually imposed on flow control equipment. Powell Engineering is always ready with valves that are correctly designed to meet every new requirement.

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THIS NEW 48-PAGE BOOK is crammed with latest information and statistics about this fastest growing market of the Nation—in fact, four rich markets in one . . .

With enormous industrial production, power supply unequalled, valuable natural resources.

This book shows that Metropolitan Oakland Area is at the very heart of this amazing NEW West . . . the most favored location for reaching and serving the Eleven Western States, the Orient, the World . . . by rail, by air, by water, by truck . . . at low cost, in less time.

Prepare now for postwar Western business. Get the facts, work up your specifications, select your Metropolitan Oakland Area site, be ready to let contracts the day the war ends.

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The NATURAL Industrial Center of the NEW West

payment which broke a ten-year dividend-drought.

Even more cheering to the stockholders was the fact that S.P. directors called next month's disbursement a "quarterly dividend" after having previously attached the same "quarterly" label to the 50¢ payments of last June (when 25¢ "extra" was also paid) and September.

This strongly indicates to the Street that (though the board didn't call next month's disbursement a "regular" dividend) actually the yearly dividend rate has been upped to $3 and that S.P. will use the new 75¢ quarterly rate as a basis for its future dividend declarations.

Since $3 a share would necessitate an outgo of over $11,300,000 of cash yearly, some rail analysts wonder if the new rate means that the management has about finished its spectacular debt retirement program of recent years made possible by the system's large wartime earnings.

BIG BOARD SEATS DOWN

Wall Street has been pretty chipper over the gradual rise in value of New York Stock Exchange memberships since 1942 (BW—Mar.25'44,p83). Last week the optimism dimmed when it saw the sale of a seat chalked up at only $60,000, or some 20% less than the $74,000 six-year high registered a few weeks earlier.

Brokerage circles generally don't attribute this sharp drop to any special fears that trading volume or prices on the exchange will fall sharply over the near term.

Instead, they blame the decline on the widespread feeling of caution in the financial district engendered by the implications of greater control over floor trading. This feeling has been heightened by the recent ruling that all members of the exchange and their firms must submit weekly reports in detail covering all deals in listed securities made for their own account (BW—Nov.18'44,p85).

OLIN-WESTERN MERGER

One of the country's largest munitions manufacturers, Western Cartridge Co. (BW—Mar.25'44,p32), will merge with Olin Corp. under terms of an agreement yet to be approved by Western's stockholders. The consolidated company, Olin Industries, Inc., will issue 155,624 preferred shares and 2,130,000 common shares in exchange for outstanding shares of Western and Olin Corp., both of which are operated by Franklin W. Olin and his two sons.

"Imagine a world airline with those 20 new *Martin Mars Transports!*"

Yes, just imagine an airline equipped with 20 huge Mars flying boats like those now being built for the U. S. Navy! World's largest planes, they weigh 82 tons, ten tons more than the original Mars. World's safest overocean aircraft, they can take off or land at sea. World's most efficient planes, they will operate at the unbelievably low cost of 10 cents per ton mile!

What 20 Martin Mars Could Do

Operating as a fleet of luxury liners, 20 Mars transports could afford complete living facilities for 1600 passengers on non-stop flights of 24 hours duration. As cargo ships, they could rush 400 tons of freight to any spot on earth in 3 days or less. And as mail carriers they could speed 20 million letters to Europe in a few hours. Supreme in the skies, these great aircraft are opening a new era in transportation!

Tested And Proven

No untried, visionary design, the Mars type has been tested and proven in grueling wartime service with the Navy. Victory will find Mars production lines fully manned and tooled to assure prompt delivery and minimum production costs. No wonder Martin Mars transports are known as, "the answer to an airline's prayer!"

THE GLENN L. MARTIN COMPANY,
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Builders of Dependable Aircraft Since 1909

Just How Big Are The New Mars Transports?

- If stood on one wing, the Mars' other wingtip would tower 200 feet into the air . . . as high as a 20-story building.
- Mars' wings are so thick that crew members can enter them to service engines while in flight.
- These Mars transports each have a cubic content equivalent to a 14 to 16 room mansion.
- Each Mars contains 1½ million rivets—4¾ miles of wiring—⅝ of a mile of piping—18 interplane phones.
- When fully fueled, these ships carry a tank-car of gasoline for their 4 huge engines.

LABOR

Jobs for Veterans

Auto industry's plans for puting ex-servicemen to work are focusing attention on industry-labor contest for soldiers' favor.

Jockeying for position in a fight between industry and labor for the favor and support of the nation's 12,000,000 servicemen is nearing an end, and the first phase of the campaign itself will begin as companies and unions get down to the serious business of negotiating new contracts.

• **Programs in Autos**—In rapid order last week the Big Three of the automobile industry proposed plans for the re-employment of veterans, and two major labor unions in the industry countered with their programs.

The three proposals by the manufacturers, closely timed and coming after a series of discussions by industrial labor relations men, were widely interpreted as trial balloons to test public—and labor—opinion on just how far the nation's plants can go in hiring veterans and in exempting them from the seniority clauses in labor contracts.

• **How They Compare**—The proposals differed sharply:

Ford Motor Co. would give nonemployee veterans seniority over all nonveteran employees of the company in hiring and laying off of workers.

General Motors at its own option would give nonemployee veterans preference over all nonveteran employees hired after May 1, 1940.

Chrysler Motor Co. would give nonemployee veterans simple seniority over nonveteran employees based on their tenure of war service.

• **Superseniority at Ford**—All three would recognize the right of employee veterans to their old jobs or jobs of equal pay and seniority, and would allow accumulated seniority for service time. Ford would go further, to permit superseniority for its former employees on their return from military service or the merchant marine.

All would provide for disabled employee veterans the right to jobs adapted to their handicap, without regard for seniority, and would provide for necessary training.

• **Point of Disagreement**—Unions are in general agreement with the companies on the rights of returning veteran employees and those disabled in military service, although not on Ford superseniority proposals. Primarily, labor unions' disputes with the company plans are based upon the rights to be given nonemployee veterans when they enter industry.

The dispute is given point by the fact that already some 20,000 ex-servicemen are employed in Detroit war plants, and that the Army has indicated that V-E Day may bring discharges for some 3,000,000 or more servicemen, many of whom will report to factory employment gates to ask for jobs.

• **Bar to Jobs?**—Unless the question of policy is settled now, industry fears many veterans will find that seniority restrictions bar their employment.

There is a desire on the part of both industry and labor to avert this possibility and to make a generous effort to show home-front gratitude to the men in the armed forces.

• **For Postwar Strength**—Behind that, however, is a struggle that might well determine the strength of unions when the veterans return, many of them bitter toward unions because of the strikes and labor controversies since Pearl Harbor. If industry promulgates liberal, widely publicized re-employment programs, the result may be a nucleus of nonunion sentiment to counteract war-inflated union strength.

Unions, on the other hand, must overcome antilabor prejudices and at the same time protect the jobs of workers hired during the war—a large part of them union members.

• **Where Interest Lies**—They are relying largely on union members in the services (an estimated 2,000,000 from all trade unions, 325,000 from the United Auto Workers) and for that reason are interested in liberal terms for employee veterans. They are much less interested in the nonemployee veterans and are fearful that their entry into the nation's factories will be at a cost of displacement of union members.

For this reason they refer to employment of nonemployee veterans in the broad terms of job creation programs.

The pattern of this re-employment picture was revealed in last week's events.

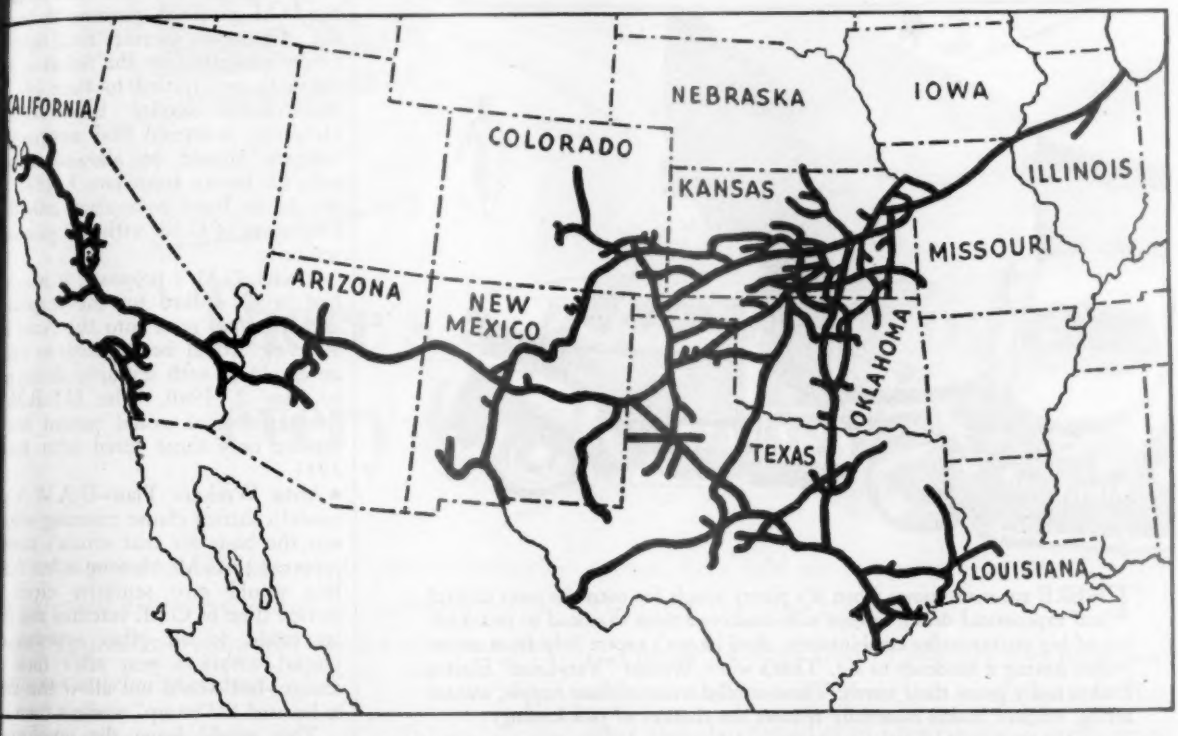
• **Spread the Work**—General Motors proposed to the United Electrical, Radio & Machine Workers and the United Auto Workers that two new provisions be written into their contracts covering some 400,000 employees. They

CALLING FOR HELP

At his Washington desk Paul V. McNutt discusses with two lieutenants of his War Manpower Commission a new campaign to recruit pulpwood cutters. Facing this tough job with him are William W. Bardsley (left), WMC's rural industries chief, and John W. Collins, placement bureau director. Getting up steam in 27 states, the drive is aimed at providing raw materials for paper, paperboard, and vital chemicals. But with artillery shell plants getting first crack at manpower, WMC may have to requisition more prisoners of war in the U. S. for wood cutting (BW—May6'44,p10).

new business sites

along the Santa Fe



s American industry knows, the ar has increased the population d accelerated the tempo of in- stry in the West and Southwest. Perhaps your company is even w eyeing one or more of the estern or southwestern states with iew to moving "out where new dustrial history begins" in peace- me.

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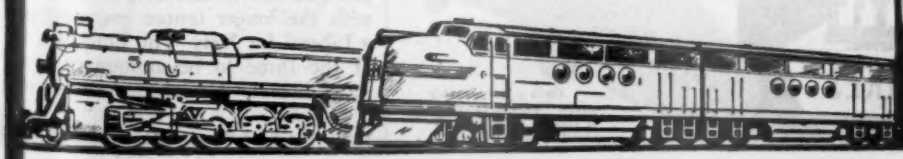

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would specify that employees on ... tary leave who return disabled ma... placed in any job they can do wit... regard to seniority, and that vete... not previously employed by G.M. ... be hired regardless of seniority of ... ployees who took plant jobs after ... 1, 1940.

The U.E.R.M.W. responded wi... suggestion that G.M. undertake to ... jobs for returning non-G.M. vete... without displacing civilian emplo... with higher seniority. To this en... recommended an adjustment in wo... working hours to spread the work.

• **A Counterproposal**—It agreed ... employee veterans (not mentioned ... the G.M. proposal, presumably bec... the corporation assumes their rights ... amply protected by the Selective S... ice Act) are entitled to their jobs ... accumulated service time senio... However, it argued that nonemplo... veterans should be allowed senio... only for service since Jan. 1, 1941. ... should be hired to replace only th... employees of G.M. with less plant-w... seniority.

Under G.M.'s proposal, a man ... had never worked for the corporat... and who had gone into the Army ... 1, 1944, would be entitled to rep... an employee with seniority dating b... to May 2, 1940. The U.E.R.M.... counterproposal would permit him ... replace only those hired after Jan. ... 1944.

• **Auto Workers' Plan**—U.A.W.'s ... model contract clause covering veter... was the basis for that union's count... proposal to G.M. Among other thin... this would give seniority credit ... service time of G.M. veterans and si... lar credit to all other veterans ... ployed within a year after their ... charge—but would not allow this cre... to be used to "bump" workers from jo...

This would leave the employm... of nonemployee veterans in the sa... dubious status as now exists.

• **Chrysler's Proposal**—The Chry... Corp. proposals would incorporate ... contracts the Selective Service pro... sion that former employees can ret... to their old or similar jobs within ... days if work is available, give disab... veterans who are former employees ... right to new jobs with the same pl... seniority, and permit the hiring of ... erans not previously employed by Chr... ler on the basis of company senio... equal to their service tenure since M... 1, 1940.

The Chrysler plan differs from t... of General Motors because it in... changes service and corporate seniori... with the longer tenure governing jo...

• **Liberal for Vets**—The Ford plan, ... of the three to be announced, is t... most liberal. Under it, veterans w...

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WINGS over the famous PT BOATS

WING FEATHERWEIGHT UNIT HEATER—TYPE HC *to which have been added two warm air ducts shown in photo above at (B).*

WING REVOLVING UNIT HEATER *shown in photo above at (A).*

SWARMING over the oceans of the world like clouds of wasps from an angry nest, the production of Uncle Sam's PT boats is another of the great achievements of American shipbuilding.

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As shown by the photograph above, one large Wing Revolving Unit Heater (A) keeps the entire boat shed warm and comfortable for the workmen, although the "floor" of the shed is the surface of Newark Bay itself, and temperatures in midwinter drop to zero.

Under such conditions only the continuous thorough coverage of warm air furnished by the *revolving* Wing unit heater could accomplish this result.

Another unique application of Wing heating in the same boat shed is the Wing Featherweight Unit Heater, shown at (B), with two warm air ducts ending in flexible boots which were inserted in the hatches of the boats to facilitate interior painting. This painting had to be done as the boats, already launched, lay in the water of the bay in the boat shed. Northern Air Engineers worked out the Wing heater solution for drying this paint immediately, consequently the painting job has been of the same high standard of speed and quality that has characterized the whole job of PT production.

Write for a copy of Heater Bulletin HR-4

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entered the services before Jan. 1, 194 and who were not formerly employe by Ford, would be allowed seniority the date they were inducted into ser ice, effective at the time of emplo ment. Veterans who entered the ser ice after Jan. 1, 1942, would be giv seniority to Jan. 1, 1942, regardless the induction date.

The company would reserve the rig to hire honorably discharged veterans any time, even when other employe have been either temporarily or pe manently laid off, and bypass the senio ity rights of other employees to hire a veterans in the event of either temp rary or permanent layoffs.

Former employees among the vete ans would be given the right to speci in which of the Ford plants they wou prefer to work, and would be tran ferred without sacrifice of seniority.

• **Vacation Bonuses**—The company al announced that the regional war lab board has approved its plans for vac tion bonus allowances for reinstate veterans, under which all veterans prev ously employed who return to any For plant within 60 days after their di charge get paid vacations, varying a cording to company service, with tim spent in the armed forces or merchan marine counting as equivalent to tim worked. Of 44,000 former Ford em ployees on military leave, some 2,50 have returned and have received ap proximately $80,000 in vacation pay the company reported.

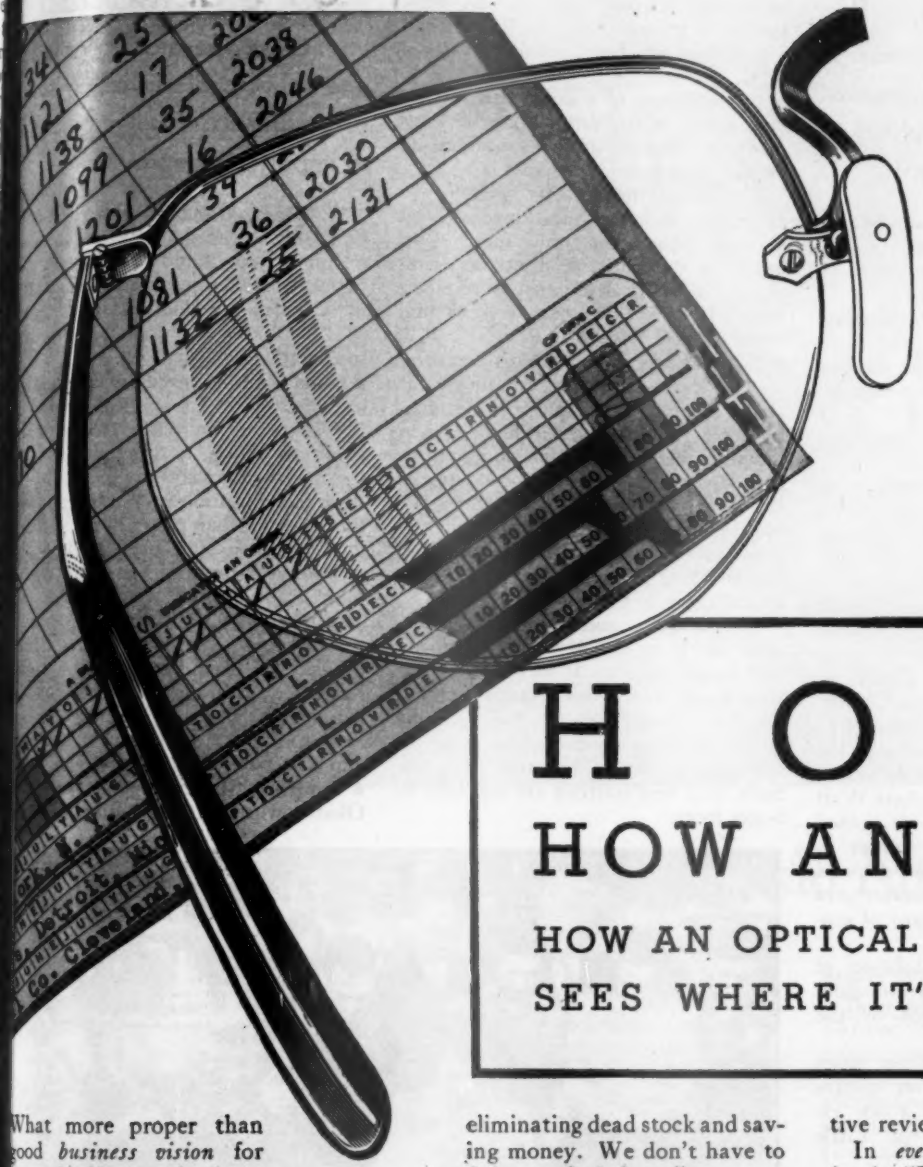
Of the three plans, the automotiv industry is inclined to believe the For program is too extreme and to favo the G.M. proposal—which it consider ideal but difficult to put over in negoti ations with the unions. The Chrysle plan it believes easier to sell, but insuf ficient.

70 WILDCAT STRIKERS FIRED

Unauthorized strikes in violation o labor's no-strike pledge will not b tolerated, officials of the C.I.O. Unite Auto Workers in Atlanta, Ga., mad clear in approving discharge of 70 unio members by the Bell Aircraft Corp. afte a six-hour walkout at its bomber plan in Marietta.

When employees of the electrical de partment, most of them women, le their jobs after the transfer of a super visor, U.A.W. officials ordered them back.

At the end of six hours, when wor had not been resumed, the 70 employ ees were summoned to a meeting in th plant labor relations office. There union officials told them that when they vio lated their no-strike pledge, they for feited union protection. Company offi cials then handed out discharge slips



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SYSTEMS DIVISION

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U.A.W. Loses

Controversial issues in Chrysler pact decided against union by the NWLB's refusal to review regional decision.

Far-reaching demands made by the C.I.O. United Auto Workers on the Chrysler Corp. have been rejected by the National War Labor Board.

The rejection, which has no bearing, however, on the pending request for a general wage increase, took the form of refusal to review findings of the regional war labor board at Detroit (BW—Jul.1 '44,p108) in a dispute over terms of a new contract.

• **No Publicity Fanfare**—Observers on the labor front were perplexed—and somewhat red-faced—that the rejection, though dated Oct. 20, still is generally unknown. Customarily, important decisions of this sort emerge from NWLB or its regional offices with a fanfare of publicity.

Two industry members of the board, S. Bayard Colgate and Fred Climer, joined two public members, Edwin E. Witte and Dexter M. Keezer, in the refusal to review. Two labor members, John Brophy (C.I.O.) and Robert Watt (A.F.L.), dissented; but Watt joined the public and industry members in approving rejection of a union demand for company payment of insurance and group hospitalization premiums of employees with seniority.

• **What Was Involved**—Substance of the regional board's determination, which has now been ratified by the national board, was:

(1) Requests for specified pay raises and reclassifying of rates on certain jobs had been denied—with a few exceptions—as violations of the Little Steel formula.

(2) Union demand that Chrysler set up a postwar stabilization fund to provide for unemployment contingencies during reconversion had been turned down on the grounds that a postwar issue of that sort could not with propriety be decided by the NWLB, a war agency. Further, it was pointed out, such future payments would be a part of present compensation, and hence a point involving the Little Steel formula.

(3) A demand for company guarantee of a 40-hour work-week had been rejected on propriety grounds.

(4) The union call for the company to pay the insurance premiums of workers on the seniority list had been rejected as a Little Steel formula violation.

(5) A union demand for prior mutual agreement on pay rates for new work had been turned down on the basis of a precedent which was set by NWLB in 1942.

(6) Rejection of a union demand for elimination of pay differentials between plants in various cities had been made on the same precedent basis.

(7) Union demand for greater pay allowances in lieu of vacations had been allowed, about the only major gain made by the union in the case. Employees of one-year seniority were raised from $45 to $54; five-year workers were raised from $95 to $108.

• **Negotiations in 1943**—Final decision on the Chrysler matter was drawn out about as long as any previous automotive case. Initial negotiations began in the summer of 1943; the request for a general pay raise "without regard to the Little Steel formula" was made last November; the Detroit decision on the other issues was rendered last June; and the Washington rejection of the union appeal came in October.

During the period of publicity blackout, which apparently both company and union were loath to lift, the contract about which the dispute centered was fast expiring. It ends Nov. 29, but it will likely be continued on a day-to-day basis like its predecessors. Negotiations on a new contract are expected to begin soon.

Phones Tied Up

Ohio operators cripple to and some local service by strik protesting cost-of-living bonu to imported attendants.

A long controversy over represent tion and wages between independe telephone unions and the National W Labor Board erupted into strikes th week which crippled telephone servi in 25 Ohio cities and threatened spread to other areas.

• **Panel Set Up**—Presidential seizure w imminent after union heads defied NWLB order to return to work an admitted doing nothing to end th strike. On Tuesday the board held show cause hearing in Washington, b the merits of their case will not be hea until the strikers are back on the job.

The walkout originated in Dayto Nov. 16 in protest against Ohio Be Telephone Co.'s paying $18.25 a wee cost-of-living bonuses to operato brought in from other cities—"carpe baggers" the unionists called them—t handle the large toll business resultin from Army Air Forces activity at Wrigh and Patterson fields.

• **Sympathy Strikes**—Operators in oth Ohio towns and cities quickly struc

PRAYERS FOR PEACE

For countless war workers throughout the land Armistice Day was no holiday again this year. Only a minute's silence or a brief prayer for early victory in the present conflict set apart the 26th anniversary of the Worl War's end. For a typically impre sive ceremony, Rev. Virginia Nelso converted a temporarily idle millin machine at the Oscar W. Hedstro Corp., Chicago, into an altar aroun which workers bowed in prayer.

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Meanwhile husky gun crews work with speed and precision to keep shells screaming toward the enemy on a split-second schedule. And men of the service batteries toil and sweat—servicing motor equipment, and supplying the shells.

That the Field Artillery was ready with highly efficient weapons when war came, and that it has developed even better ones since, is a tribute to the foresight of our artillerists who have been constantly planning and experimenting to insure that our guns will be superior to those of the enemy.

Changes also were made in the organization of the Field Artillery, the better to perform the artillery's twin missions: to support the Infantry, Cavalry, and Armored Forces... to give depth to the battlefields.

The results are evident on every battle front. Today, American Artillerymen smash in seconds targets that once took minutes, even hours. They achieve simultaneous massed fire of many battalions that amazes old timers—and confounds the enemy.

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in sympathy with the Dayton work and many Western Electric Co. e ployees (who make telephone equ ment) and American Telephone & Te graph Co. long-lines workers refu to cross the picket lines.

Toll calls were cut an estimated 5 in the struck cities and some sm communities were left without a phone service at all. Emergency cre handled essential calls in the big w centers. Local service in cities hav automatic dial systems, including D ton, was normal.

• **Twofold Purpose**—Time after ti within the past two years telepho unions in different parts of the coun have taken strike votes, most of th with a twofold purpose: to force NW action on wage demands, and to hig light the plea of independent unio for representation on the board (BW Jun.10'44,p99).

The telephone unions assert—throu their leading spokesman, Henry May the New York lawyer who represe most of them—that they and other in pendent unions never get a square de from NWLB because they do not ha equal status in Washington with t C.I.O. and A.F.L. Although the Oh strike was allegedly a spontaneous wa out, it fitted in with the pattern s in other telephone labor controversi

• **Strike Votes**—A. T. & T. workers Memphis and Louisville took stri votes a fortnight ago under terms of th Connally-Smith War Labor Disput Act, and Mayer suggested this week th the Ohio strikes might cause the Te nessee and Kentucky workers to forg their 30-day waiting period. Dayto operators had taken a strike vote b walked out ahead of time.

In 1940 the Dayton operators we making from $13 to $21 for a 40-ho week. By negotiations and two increas approved by the regional war labor boa these wages have been raised to $2 and $31. The additional $18.25 whic the out-of-towners make to cover boa and lodging has irked the local worke

• **Craft Organization, But**—The Oh Bell operators are members of the Oh Federation of Telephone Workers, a affiliate of the National Federation Telephone Workers, in which a lar part of the nation's 350,000 telepho workers is organized.

Although the telephone unions a set up along craft lines, Mayer and oth union spokesmen maintain that NWL has followed a policy of considerin wage demands on a company-wide bas ignoring the merits of individual union claims.

• **Commission Urged**—Mayer and th N.F.T.W. say the way to resolve th difficulties is, first, to appoint an ind pendent union spokesman to the boar

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and, second, to set up a telephone commission to coordinate action on wage requests. NWLB counters that the question of adding a representative from the independents has been well aired, that there are a half-dozen commissions now and the board is disposed to limit rather than to increase the number of them.

Index Sustained

BLS figures win strong indorsement in final report of cost-of-living committee named a year ago by the President.

William H. Davis, chairman of the National War Labor Board, handed labor leaders a bitter postelection dose this week. As chairman of the President's committee (appointed October, 1943) to study the cost-of-living index, he filed a vigorous defense of the much-abused Bureau of Labor Statistics figures that NWLB uses as a yardstick of price increases in relation to wage rates.

His report boils down to a conclusion that the cost of living has gone up about 30% since January, 1941.

● **Sets the Stage**—Davis carefully adhered to an appraisal of the BLS index and its statistical pedigree. He avoided any reference to the wage issue and the controversial Little Steel formula. His report nevertheless set the stage for a strict application of the hold-the-line policy on wages until Germany is defeated (page 5).

The two industry members of the five-man committee—Horace B. Horton and George K. Batt—went along with Davis, filing a separate report which concurred on most points. The two labor members—R. J. Thomas (C.I.O.) and George Meany (A.F.L.)—dissented sharply.

● **Supports Economists**—To back up his defense of the BLS figures, Davis leaned heavily on the findings of a technical committee of economists. The three members of this group filed a report last summer testifying to the good character of the BLS index (BW—Jul.1'44,p32). Davis' final report is essentially an indorsement of their findings.

With the economists behind him, Davis states this as his main theme: "The accuracy of the BLS index figures for what they are intended to measure is confirmed. They are entitled to the good reputation they have long enjoyed."

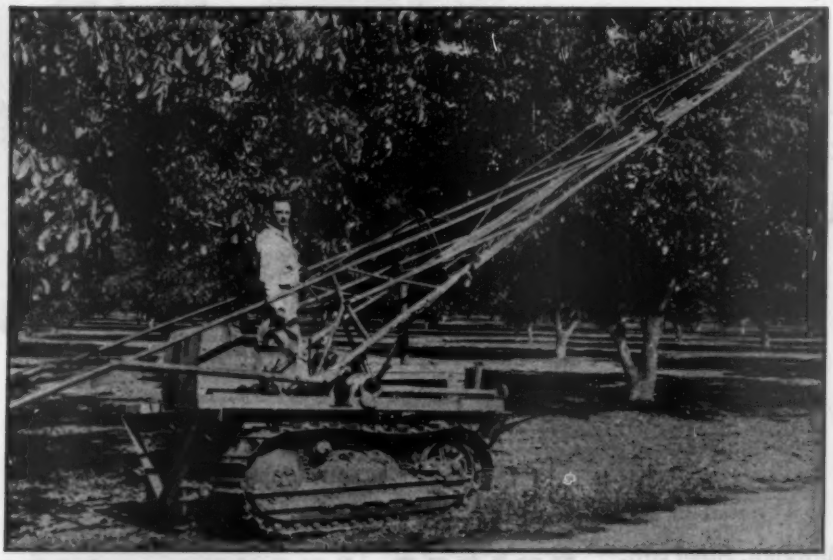
● **Unionists' Arguments**—In reaching this conclusion, Davis and the economists reject the two big contentions of labor representatives who have argued (1) that the BLS index fails to allow for concealed price increases through upgrading, quality deterioration, and the like; (2) that the index should include the extra expenses of changes which the war has induced in manner of living.

In an independent report filed last January, Thomas and Meany estim the change in the cost of living Jan. 1, 1941, to December, 194 43.5% (BW—Feb.5'44,p94). The index showed a 23.4% gain for same period.

The difference of 20 percen points resulted from the fact Thomas and Meany added 7.22 p for the difference in price change tween foods and rents priced by and those not covered by the su 6.93 points for quality deterior 3.62 points for disappearance of ch er commodities from the retail mar 1.35 points for decline in special s and 0.98 points for under-reportin prices.

● **Leeway Allowed**—Davis, quoting economists, concludes that an allow of three to four percentage point enough to take care of all these. I adding the correction to the in (which now shows a gain of 25 since January, 1941) would give a time increase of only 30% in the of living.

Davis makes one significant ex tion to his general conclusion. The dex, he says, measures price cha "for goods customarily purchased families of wage earners and lo salaried workers living in large citi It does not give a fair measure of rise of living costs in the lowest inco bracket because food, clothing, low-priced commodities—the items which price rises have been greate make up a larger proportion of family budget in this group than in wage band that BLS uses as a ben mark.



WALNUT SHAKER

One man's solution to manpower shortages in California walnut groves is a long tractor-mounted boom that shakes down the crop. This harvesting machine does the work of about six hand-pickers in covering some five acres a day—according to its builder, J. J. Brinderson, Chino (Calif.) rancher. Entirely homemade, this novel walnut picker is not in production.

STRIKING FOR AN ELECTION

On Dec. 7, 1941, when the rest the world was contemplating the con quences of the Japanese attack on P Harbor, A.F.L. Teamsters Local 25 Boston was electing officers to han union affairs for the ensuing year. men who were elected that night h remained in office ever since; they h declined to schedule the regular ann elections until the war is over.

Rank-and-file resentment against t policy came to a boil after almost th years, and last week it flared into a str of truck drivers that seriously impe delivery of foodstuffs in Boston.

The incumbent officers fanned t flames of protest by suspending fi membership the 14 drivers who ser as a committee for the strikers. Alm overnight, the ranks of the strikers creased from about 200 to more th 4,000 of the union's 6,000 members.

Gov. Leverett Saltonstall permitt members of the State Guard to m trucks delivering perishables and ho

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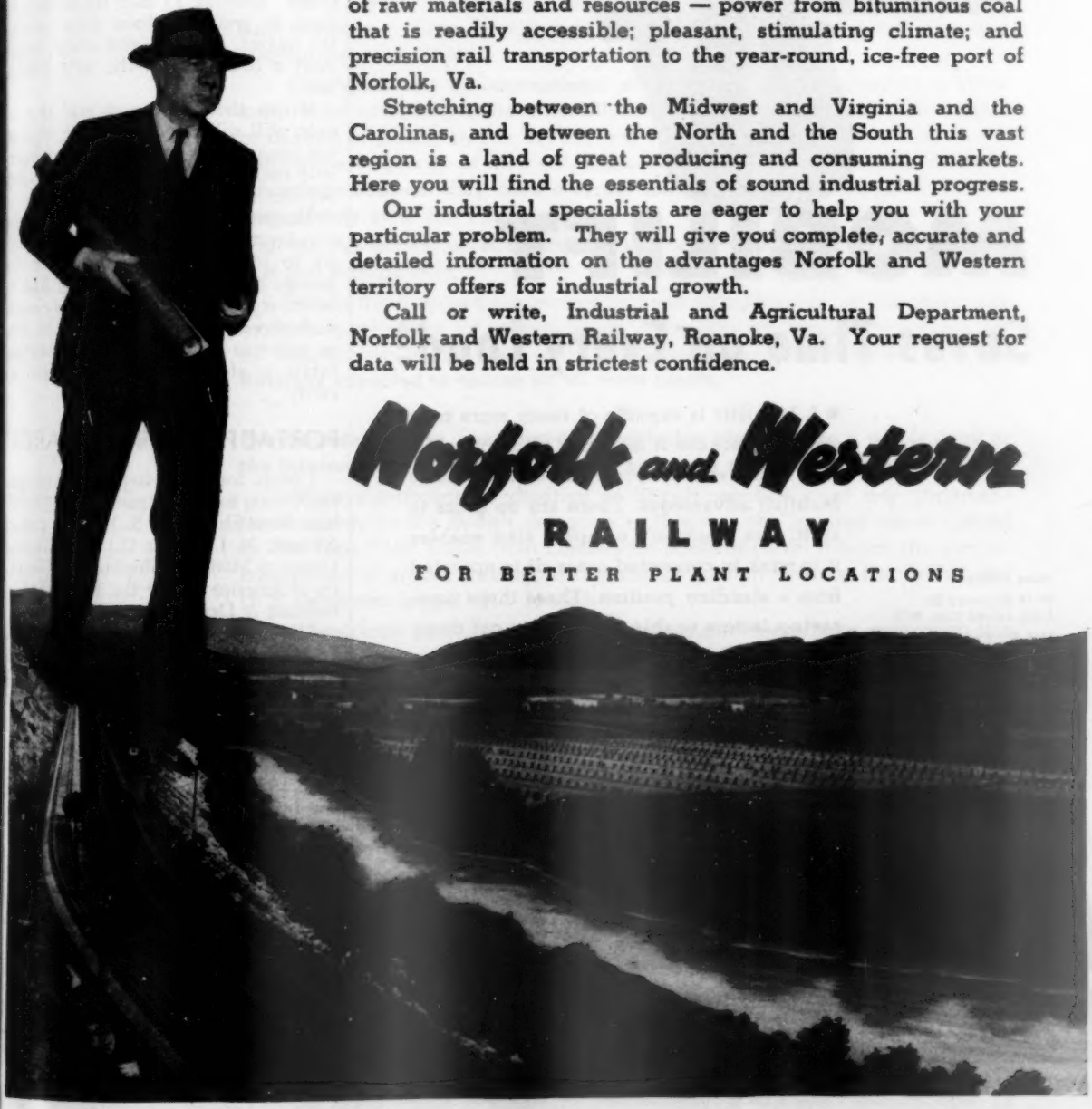
Call or write, Industrial and Agricultural Department, Norfolk and Western Railway, Roanoke, Va. Your request for data will be held in strictest confidence.



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tal and military supplies, and the city provided police protection to other drivers willing to brave picket lines. The strikers refused to consider a return to work until assured an election and the reinstatement of the 14 suspended committeemen.

FLORIDA LAW DEFIED

Florida's new constitutional amendment banning closed shops (BW—Nov. 18'44,p18) this week appeared headed for a speedy court test as the regional war labor board in Atlanta, Ga., ordered a maintenance-of-membership clause in a contract between the St. Joe (Fla.) Paper Co. and three American Federation of Labor unions.

The board said that its m. of m. order contained the usual "escape clause" allowing 15 days for workers to elect to join or refrain from joining the unions, and that this clause might avert a conflict with the new Florida law.

If not, then the board said that its order still will stand since the regional war labor board's wartime powers supersede conflicting state laws where labor disputes are involved.

Meanwhile, George L. Googe, southern director of the A.F.L., urged workers to remain in Florida despite the passage of the amendment. He had received reports, he said, that many union workers were planning to leave the state in order to seek jobs with a postwar future in states that permit union security.

PORTAL PAY FOR SHIPYARDS?

Claims for portal-to-portal back pay amounting to approximately $5,000,000 have been filed in U. S. District Court, Newark, N. J., by the C.I.O. Industrial Union of Marine & Shipbuilding Workers of America against the Federal Shipbuilding & Dry Dock Co. of Kearny.

The union, which claims to represent 40,000 employees of the U. S. Steel Corp. subsidiary, alleges that the company failed to compensate workers for time they spent obtaining and returning their tools.

The period covered by the suit is from 1938, when the federal wage-hour law became effective, to March, 1944, when the company installed lockers for the workers at the union's request and eliminated the time loss. Workers lost between 15 and 30 minutes daily without pay, the union contends, when they were required to report to tool cribs before and after each shift.

The claim is based upon the portal-to-portal pay decision of the U. S. Supreme Court in the United Mine Workers case (BW—Apr.1'44,p18).

THE WAR AND BUSINESS ABROAD

USINESS WEEK
OVEMBER 25, 1944

Proponents of a strong private enterprise system, pitted against important groups demanding increased international regulation of business, have won the opening round in the battle over postwar commercial aviation which has been waged for nearly a month at the International Civil Aviation Conference in Chicago.

Draft proposal, now to be submitted for approval to the governments of the 52 participating nations (including the U. S. where it must receive a two-thirds vote in the Senate to be accepted), calls for:

(1) Creation of a **world assembly** to coordinate civil aviation, with every nation—large or small—allowed an equal vote, but with actual business between sessions of the full assembly to be handled by a smaller **elected council.**

(2) **Technical regulation,** through the council, which will provide for such things as uniform landing signals, weather reports, airport facilities, and quarantine regulations.

(3) Agreement on **international air routes** to be negotiated on a bilateral, reciprocal basis, rather than allocated on an international control basis as desired originally by the British, and with the individual countries determining the frequency of their schedules. **(This gives U. S. lines an immediate advantage because they have a larger number of planes available for use immediately after the war.)**

(4) Agreement on **minimum rates** in order to avoid cut-throat competition and subsidy wars.

While the proposed agreement may not be ratified by all countries and made fully effective for several years, it provides an immediate pattern for all negotiations in this field of international commercial aviation, **with the Russians expected to concur on all main points.**

●

Private enterprise vs. governmental regulation also became a major issue at the International Business Conference before its sessions closed at Rye, N. Y.

More significantly indicative of British reaction than any statement made openly by the British delegates at Rye was the inspired report cabled to The New York Times from London for publication on the day the conference closed of an unconcealed difference of opinion between the British and U. S. delegates (page 121). It said:

"American public opinion in its enthusiasm for private enterprise has failed to grasp to what extent German National Socialism has made socialism in Europe inevitable, even where unwanted.

"Britain, although still theoretically capitalist, has accumulated so many debts, lost so much trade, and hypothecated so many overseas investments during the war that nothing but controlled collective action over a long term of years can put her on her feet.

"And private ownership in Europe has been so confused and compromised by the Nazis and their collaborators that European governments are being forced to take over large segments of it."

●

Britain, nevertheless, this week took the first step in a postwar plan to return 1,000 government-controlled war plants to private ownership.

Plans were announced for the auction within a month of five factories all of which were privately owned before the war.

Simultaneously, however, it was announced in London that not all surplus factories will be sold.

To bring about a balanced distribution of industry, development of

special exports along the most economical lines, and to fit industry into national town-planning schemes, the government has quietly let it be known that **certain plants will be leased for ten years at 1939 rental rates for peace production by applicants selected by the Board of Trade.**

•

Don't miss other moves which indicate the development of significant postwar trends in various parts of the world.

As in **Egypt and the Middle East,** where prices are falling sharply with the departure of large numbers of troops and the resumption of modest quantities of imports, **Mexican** prices are also beginning to slip.

Chemicals lead the list of Mexico's price declines, but electrical motors are selling at 35% less than the wartime peak, iron wire is down 30% and electric switches 40%.

Mexican wholesale volume is dropping rapidly as retailers rush to dispose of stocks acquired at peak prices and delay replacements in the hope of securing cheaper supplies next year.

•

Brazil, still asking the U. S. for higher **coffee** prices, has eased its stock position by arranging with the United Nations Relief & Rehabilitation Administration for the disposal of 900,000 bags for relief purposes in Poland, Czechoslovakia, Greece, and Yugoslavia.

An equal amount will be sold to Holland, Norway, Belgium, Denmark, and France.

Negotiations are also under way in Brazil for the sale of **sugar, beans, fish, hides, fodder, and vegetable oils,** but quantities that can be spared are probably too small to make deals attractive to big foreign buyers.

•

Not to be overlooked, particularly by middle western farmers, is the revelation that **Argentina this year will export 160,000 tons of pork products,** compared with 129,000 last year, and a bare 350 tons in 1915.

Though Argentine hog raising has been stimulated by cheap corn (which shortage of ships makes it impossible for Buenos Aires to sell abroad), **farmers estimate that they can produce hogs even under normal conditions to sell at 6¢ to 7¢ a lb. and still make money.**

•

Nineteen Swedish shipyards have received orders for fishing boats for Iceland, total value to top $3,125,000—**another indication that the Swedes are getting a head start in postwar business.**

•

U. S. hospital equipment suppliers may soon receive orders from Mexico's Federal Health & Sanitation Dept.

Of 50 hospitals now under construction in the biggest public health program ever undertaken by Mexico, eight will include more than 100 beds, and one—at Puebla—will accommodate 600 beds.

•

There's more than a war meaning to the 2,000-mile oil pipeline from Calcutta across north Burma to the B-29 airfields in the neighborhood of Kunming, southwestern China (BW—Mar.18'44,p54).

Source of large quantities of unexploited minerals, the Kunming region, according to Chinese economists, can become a new center of heavy industry after the war. **An assured flow of oil from the—eventually—important Burma fields provides the base for a rapid development of motor transport.**

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Benefits at Rye

Conference is expected to result in a more intelligent approach to world problems. Business contacts are fruitful.

Although the International Business Conference, held at Rye, N. Y., adjourned without a formal declaration of its conclusions and future objectives, it cannot be assumed that the parley was unfruitful.

• **Great Significance**—The reports of the various technical committees were in most cases statements of general policy, with emphasis on disagreements. But the subjects tackled have great significance for business, and are currently the basis of important negotiations among United Nations governments.

That questions of commercial policy, cartels, industrialization of backward areas, treatment of investments, and raw materials controls were approached by businessmen of the 52 nations represented will mean that future government proposals on these subjects will be more intelligently received throughout the world.

And without question, the attitudes expressed by the Rye conferees will influence the approach of governments to these issues.

• **New Contacts**—But for American business, the most important facet of the conference was the opportunity it gave American firms to renew old commercial contacts and acquaintances and make new ones. As predicted (BW—Nov.11'44,p111), informal negotiation of future business really starts with the end of the conference.

In the first place, many delegates planned in advance to shop in American industrial centers after the conference. Others planned inspection tours of plants engaged in their line of business. Some U. S. companies have arranged such trips for dollar-short delegates.

But in addition, many who intended a speedy return to work at home have been faced with indefinite delay in transportation. These will certainly be available to alert U. S. salesmen anxious to unveil products available for postwar sale.

• **To Visit Plants**—Several members of the Swedish delegation, for instance, expect to spend several months in this country. K. Fredrik Goransson, chairman of the Sandviken Steel Works, will go to Chicago; Gunnar Engberg, president of the Eriksbergs Shipyard & Machine Works, and Dan-Axel Brostrom, president of the Swedish East Asiatic Co., Ltd., will visit West Coast shipyards.

And other delegates, through the Dept. of Commerce, have made known specific business propositions they hope to settle while here.

• **What They Need**—Three Iraqi merchants are seeking radios, refrigerators, motion picture apparatus, automobiles, electrical equipment, paints, textiles, building hardware and fixtures, farm machinery, textile machinery, and building iron and steel.

A Colombian delegate wants autos, trucks, accessories, farm machinery, and cattle.

A Venezuelan delegate is interested in procuring equipment to manufacture metal furniture and mattresses.

• **May Go to Britain**—Chinese delegates expect to travel separately and in groups to visit American chemical works, railroad equipment plants, and banks. If possible, they will go to Britain before returning to China.

Indian delegates, representing firms engaged in war production, will make purchases in this country—for which dollars have been made available.

• **Another Meeting?**—If plans materialize for another similar meeting next year, even further advantage may then be taken of the opportunity to do business with the key delegates from all parts of the world.

Dollars Scarce

Current world shortage of dollars and vast accumulation of sterling credits present a problem for Britain.

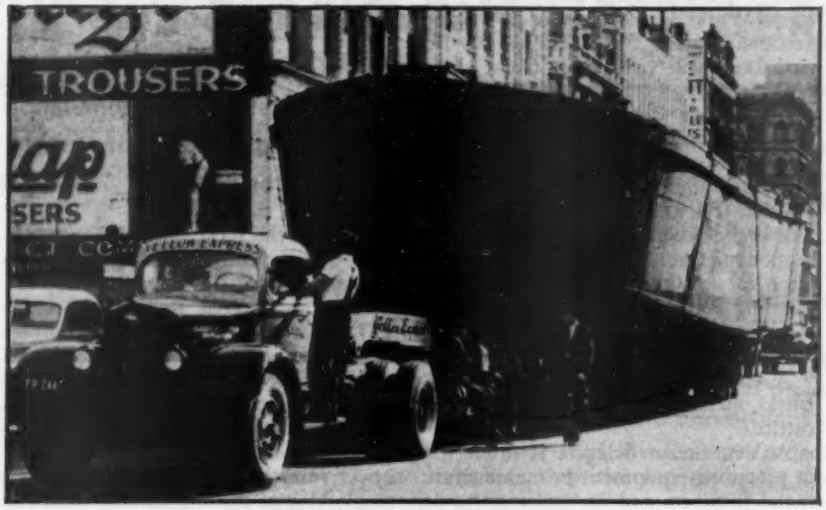
Perhaps the most cantankerous problem which reared its head officially and privately at the International Business Conference at Rye, N. Y. (page 127), was the current world shortage of dollars and plethora of sterling, a combination standing in the way of immediate postwar trade commitments by many British Empire representatives.

• **India Complains**—Business representatives from India, holder of the largest single bloc of sterling credits, were particularly outspoken about this obstacle to spending in the U. S. market. Others echoed their complaints. Although negotiations to permit India to use a larger percent of the dollars it obtains have been, and still are, in progress, Great Britain's plight is not comfortable.

In 1939, British financiers foresaw the extremes to which war would force their credit manipulations. British monetary resources were widely distributed, and many investments in Europe and Asia were destined to fall into enemy hands. Many assets were known to be nonconvertible except at great loss. Total British foreign assets in 1939,

SIGNS OF THE TIMES

England, like the United States, has entered a period of cutbacks and reconversion from war to civilian production—and the labor dislocations are comparable. Protesting a move to transfer work from their aircraft factory to another area, workers (above) storm the House of Commons with placards protesting any dole, reminding Minister of Labor Bevin of his "promise" of steady employment. England's plants, however, have thus far absorbed the temporarily unemployed, so labor's protest march is undoubtedly linked to its fight for guaranteed wages during transition.



TRUCKING TO SEA

An American-built White Motor tractor hauls a 70-ton barge on a special 30-wheel trailer through a busy Australian city. Thus the nation "down under"—like the United States—trucks many of its smaller vessels to tidewater from inland shipways. Boats of this type are included in reverse lend-lease to the U. S., which at last count had received a total of about $500,000,000 from Melbourne. One-fourth of that figure was in foodstuffs that met 90% of the American troop needs in the Southwest Pacific.

including overseas investment, gold, and dollar balances, according to a recent study by the Dept. of Commerce, were estimated conservatively at $18,000,000,000 (all conversions of pounds to dollars are at £ = $4).

Of $4,483,000,000 gold and dollar assets, only $3,227,000,000 could be reckoned available, of which $300,000,000 escaped through unofficial transfers before strict exchange controls were imposed, and other sums were either committed or required for working balances.

• **Investments Liquidated**—From the large block of overseas investment, liquidation in Canada and the United States provided the only ready source of dollars. By the end of 1941 sales of stocks and securities in the U. S. totaled $542,732,000, and reached an estimated $700,000,000 by the end of 1943. Canadian liquidations ran to barely $750,000,000.

To obtain access, through the Reconstruction Finance Corp., to an additional $425,000,000 in the U. S., Britain pledged $450,000,000 of other assets on which RFC recently announced it had received earnings of $133,931,000 to be applied to servicing the loan. Of the $425,000,000 available, Britain has used $390,000,000.

• **U. S. Has Biggest Claim**—But with dollars merely the most important factor in Britain's worldwide war spending, disinvestment continued in other areas from which it was obtaining supplies, and reached these estimated totals:

India	$1,428,000,000
South Africa	500,000,000
Australia	20,000,000
Egypt	48,000,000
Argentina	100,000,000

This sum of $2,096,000,000, with the American and Canadian totals, brought British disinvestment between 1939 and 1943 to around $4,000,000,000.

Against this figure, magnified by current British trade transactions, it was necessary to apply all of the United Kingdom's war spending abroad. In addition Britain began in 1941 to accumulate lend-lease and mutual aid debts. The United States, as the biggest war producer, received the bulk of British orders and piled up the biggest claim for arms leased and lent. By the end of 1943, for instance, Britain had spent $6,000,000,000 in cash in the U. S. and had received $6,594,000,000 in lend-lease (against which might be applied $1,500,000,000 reverse lend-lease to that date).

• **Sterling Balances**—A clew to the magnitude of Britain's overseas obligations is provided by a tabulation of sterling balances held by other countries and British government debts abroad. Using the latest data available, but excluding some areas for which reports are missing, the U. S. Dept. of Commerce reaches a figure of more than $7,500,000,000.

The chief components of this total, with the date of reports, are:

India (July, 1944)	$3,000,000,000
South Africa (June, 1944)	84,000,000
Eire (July, 1944)	100,000,000
Australia (March, 1944)	384,000,000
New Zealand (Feb., 1944)	132,000,000
Egypt (Dec., 1943)	380,000,000
Iraq (Mar., 1944)	156,000,000
Argentina (Dec., 1943)	168,000,000
Brazil (Dec., 1943)	120,000,000
Uruguay (Dec., 1943)	16,000,000
Portugal (Dec., 1943)	168,000,000
Iceland (Dec., 1943)	20,000,000
Others*	1,872,000,000
Government debts	1,012,000,000
Total	$7,592,000,000

** Including holdings of commercial banks and currency boards in the Middle East.*

• **The Point at Issue**—It is often incorrectly assumed that a large part of these holdings accumulated as a result of British exchange control arrangements for the pooling of dollar assets in the sterling area. The Dept. of Commerce estimates that not more than 25% of the total represented such transfers.

The point at issue now is not how to convert these holdings to dollars (which Britain does not possess) but to assure more dollars in the future to sterling area countries for their own use.

• **Britain's Problem**—Settlement of these sterling obligations, however, represents Britain's toughest postwar problem. It can be assumed at the outset that they cannot be liquidated solely by an increase in exports. Their size precludes this. Before the war, it may be recalled, Britain imported close to $4,000,000,000 annually and exported only about $2,500,000,000 a year. The balance of imports was paid for by income from investments, shipping, and other services.

With the liquidation and depreciation of overseas assets during the war, Britain has lost investment income which may, according to a Foreign Policy Assn. estimate, amount to only $340,000,000 in postwar years instead of $800,000,000.

• **Complex Solution**—Thus the solution of the problem can only be achieved by a combination of techniques. Among the alternatives available, these are suggested by the Dept. of Commerce:

(1) Cancellation of claims by Empire countries as a further war contribution.

(2) Transfer of British airfields and other capital installations, and of surplus war materials, to creditors.

(3) Setting up, in Britain, of currency reserves or commercial credits, subject to temporary controls, which may be freely used or transferred under specified conditions.

(4) Setting aside in Britain of sums to be used for amortization of the public debts of creditors, or the arrangement of long-term loans, or the gradual liquidation of the credit through purchases in Britain.

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CANADA

Aid Plan Eyed

Policy is unsettled, but mutual aid program is likely to be translated into a postwar trade reconstruction plan.

OTTAWA—Canada's mutual aid program of free supply of war goods to United Nations is likely to be translated into a trade reconstruction plan for the transition and immediate postwar period.

• **Concern for Canada**—Policy has not been definitely determined, but the thinking of trade officials and government economists is beginning to crystallize in this direction. Concern for Canada's own economic interest is the dominating factor influencing the trend.

Policy may be finally settled after discussion between Ottawa officials and Lord Keynes, who is expected to visit Canada after his talks in Washington. Restoration of normal trade with Britain is a central consideration for Canada, and Britain's position in respect to Canadian dollars and the potentialities of the United Kingdom market need clarification.

• **Is Fund Sufficient?**—Discussions with Lord Keynes will probably go deeper than that, into whether Canada's mutual aid fund is sufficient to finance Britain's needs, and what goods are likely to be required from Canadian production in the near future.

These talks may pave the way for an agreement on transition and postwar trade recovery credits between the two countries.

• **British Purchases**—Whether Britain's postwar buying in Canada will be larger or smaller than before the war, and what Canada can do to assure a favorable answer, are two questions with which Ottawa trade officials are grappling.

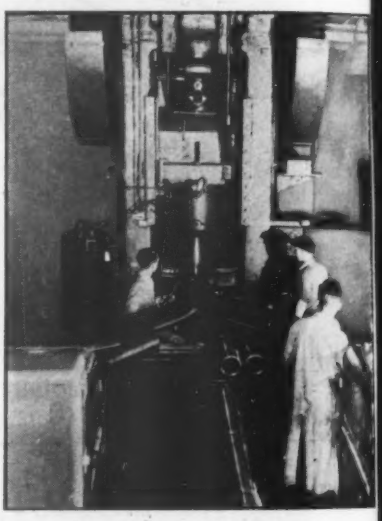
In Washington-London-Ottawa commercial policy discussions, reduction of tariffs by multilateral agreement has involved talk of drastic revision of the Empire preference system. This has disturbed Canadian businessmen, to whom a bird in the hand is worth two in the bush. They welcomed, therefore, Trade & Commerce Minister James MacKinnon's assurance that Canada would make no blanket sacrifices until benefits of a multilateral arrangement were clearly visible.

• **Full Employment**—What worries Canadians about future trade relations with Britain is that country's determination to maintain full employment even if it means channeling an expanded foreign trade to sterling area countries (page 121).

Ottawa is less concerned with how much lend-lease and mutual aid the United States and Canada will be prepared to extend to Britain (BW—Nov 18'44,p15) than with how much Britain will be willing or can afford to accept.

Present contracts envisage continued export of Canadian farm, forest, and mineral products, but the picture for manufactures is unclear. Thus the mutual aid program, involving huge manufactures exports, can possibly be converted to a transition-period aid program which will bolster the Canadian economy.

• **India Wants Some**—Mutual aid, already available to Britain, the Soviet Union, Australia, New Zealand, and China, will be continued—possibly on a reduced basis—until the end of the Pacific war. India is negotiating for a share in mutual aid. Under present plans, Canada will be paid for goods with postwar utility which have been delivered or are now being manufac-



FROM GUNS TO SHELLS

A 350-ton vertical press shapes noses on the first batch of artillery shells produced by a General Motors Fisher Body plant. Tooled up and in production within four months after getting a letter of intent on the Army contract, the shop at Grand Rapids, Mich., is turning out 155-mm. projectiles. Using such rapid methods as induction heating (BW—Jun.5'43, p48), the plant will be in full production by early January.

ed. War goods supplied to United tions will revert to Canadian title the end of hostilities, and will be posed of by Canada's War Assets p. (BW—Feb.5'44,p28).

The mutual aid arrangement with tain has varied with circumstances, included first conversion of a $700,-,000 sterling balance to a long-term erest-free loan, then a $1,000,000,000 right gift, and finally a $1,000,000,-0 and an $800,000,000 mutual aid propriation (shared by others, but inly for Britain) with reimbursible alifications.

For Other Countries—Exports to ntries other than Britain, which may hard up for Canadian dollar ex-nge in the transition period, will be ilitated by the Export Credits Act, plemented by arrangements to be de by the Export Credits Insurance p., a government agency now being up.

ANE DEAL REPORTED

Reported in Ottawa, and not offi-lly denied, is a deal by which Ameri-n aircraft interests will join Canadian erests (BW—Aug.26'44,p44) in the nership of Canadian Vickers, Ltd., ontreal, whose aircraft division has a vernment contract to build 50 Doug-DC-4 transports for Trans-Canada Lines.

This may be an entering wedge for erican producers seeking to get in-e the Empire preference trade sys-n, in the event this does not collapse-ring impending international trade gotiations. Douglas Aircraft Co., sup-ng Vickers with engineering data, s waived objection to Vickers' export-g DC-4 planes to Britain.

Canadian Vickers has contracted to liver the first plane 13 months after ceipt of blueprints, and receives a e of 2%, which increases or decreases % for every $10,000 variation from target cost of $350,000 per plane 315,000 U. S.).

UBLICIZING AID TO VETS

TORONTO—Display advertisements tailing the benefits available to veter-s on their return to Canada are ap-aring currently in Canadian publica-ns. The Ministry of Veterans Af-rs is paying for the ads.

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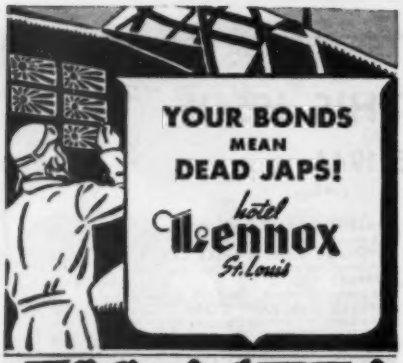

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THE MARKETS

(FINANCE SECTION—PAGE 96)

Last week's spell of price weakness proved potent enough to wipe out all the gains so laboriously recorded by the stock market since late October, and the abrupt arrival of the slump did nothing to improve Wall Street sentiment generally over the market's possible near-term price pattern.

● **Technical Reaction**—However, just as the Street's bullish elements had been fervently hoping, while prices sagged badly under the impact of last week's wave of liquidation, it soon became evident that the weakness represented a short-lived technical reaction only. For the time being at least, there was no sign of a general exodus to sharply lower price levels.

Pre-Thanksgiving daily trading sessions on the New York Stock Exchange this week, in fact, have again been disclosing somewhat firmer price tendencies.

● **Rails Snap Back**—This new-found strength has been particularly noticeable in certain rail stocks. Paced by Southern Pacific (page 103), their current move is taking the rail stock price average close to July 1942-44 highs, and their strength has been having a most salutary effect on market prices as a whole.

Trading activity has been rising somewhat, and already the financial district's bulls are predicting that a break-through to new high levels by the rail stock price index is but a matter of days.

● **Many Skeptics**—Despite the current optimism in such quarters, however, the Street as a whole is probably more bearish than bullish at the moment. Much of the gains recorded this week are ascribed to short covering or the natural bounce-back of the market after a dro as severe as that of early last week. Co siderable skepticism exists with respe to the possible near-term price trend.

What this skeptical group has not a all liked is the way liquidation has starte in recent months whenever the marke has come close to last summer's bul market peaks. This factor they conside a very clear warning that stocks gene ally are not yet ready to extend thei last major move upward.

● **Still Cautious**—This segment of th Street's market students likewise think that many investors and traders hav considerable misgivings still concernin the initial effect on industrial profit mar gins of the wage advances they see ahead and that many investors are not entirely satisfied that collapse of Ger many within the next few months would find the country fully prepared to take up the slack that would result from war contract cancellations.

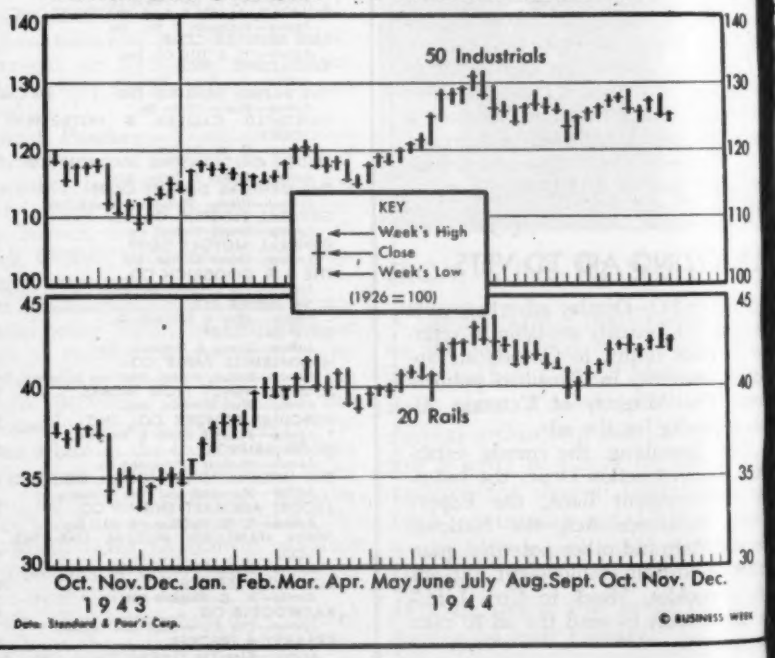
With such uncertainties to the fore obviously, this group is advising clients that the time has not yet arrived for any considerable market ventures.

Security Price Averages

	This Week	Week Ago	Month Ago	Year Ago
Stocks				
Industrial	126.1	125.2	126.1	111.8
Railroad	42.9	42.1	42.3	35.1
Utility	54.4	54.6	56.0	48.4
Bonds				
Industrial	120.6	120.0	119.5	119.1
Railroad	111.1	110.3	110.2	100.9
Utility	116.6	116.8	117.0	115.2

Data: Standard & Poor's Corp.

COMMON STOCKS—A WEEKLY RECORD



THE TRADING POST

omestic Planning Needed

The International Business Conference at Rye, N. Y., was just one of many recent manifestations of our heightened interest in foreign trade.

Representatives of private business from 52 nations gathered for these sessions to discuss such important subjects as postwar loans and investments, monetary stabilization, settlement of lend-lease obligations, cartels and quotas, and the removal of trade barriers, all of which have a bearing on the free flow of goods between nations.

The Soviet Union Chamber of Commerce has announced (BW–Sep.16'44, p112) that it will soon invite United States manufacturers to participate in a permanent industrial sample fair in Moscow, and will prepare a catalog of American machinery for circulation in the Soviet Union.

More recently, French officials were reported (BW–Nov.4'44,p112) to be drawing plans for a similar exhibit of American goods in Paris to help French industrialists plan their rehabilitation.

Of all the United Nations, France and Russia probably have suffered most from the direct effects of war. No one hints that they are forgetting the war, because we all know how much evidence of death, destruction, and malnutrition must prevail in those lands.

Everyone knows that the port facilities available to the Allies on the continent of Europe are being used primarily for military goods. Everyone seems to take it for granted that no postwar plans for Europe will be allowed to interfere with the prosecution of the war to final victory.

* * *

It is true that the people of the United States have not been as close to this war as the people of Europe. We have not seen our communities ravaged by the Nazi war machine. But I suspect that we are adult enough to know that any postwar plans we make in the home front must be contingent upon first producing enough of the machines and materials to enable the men in uniform to win the war.

The Washington attitude seems to be that the people cannot be trusted to arrange war production and postwar planning in their proper order. The official policy often is unofficially expressed as: "We don't see how you can talk about reconversion when we face the risk of six, eight, or even twelve more months of war in Europe," or "Let's not mislead the American people into thinking that our production superiority means the war is won."

As early as 1937 we had definite warnings that war was likely to break out in Europe. Our experience of 20 years before should have convinced us that we should put our house in order and be prepared to meet any emergency. But there were many who said: "Let's not talk about it, and maybe we won't be involved."

Subsequent events proved that we should have been talking about it, and doing more about it. But the hush-hush contingent did have a good talking point in their argument that we might possibly avoid war. That is more than can be said for those who now argue that we shouldn't be talking about postwar selling. For sooner or later, we shall have to face the problems of reconversion.

* * *

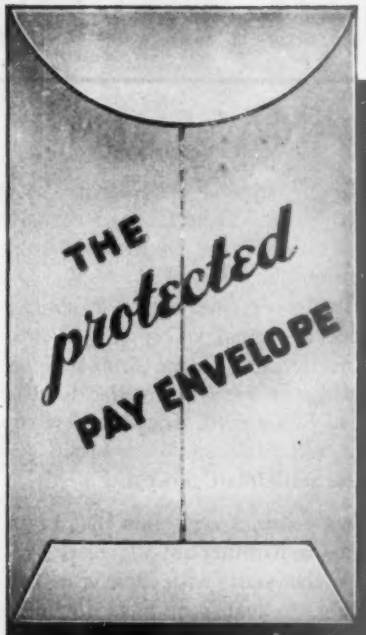
We are constantly warned that unless our postwar production exceeds that of any previous year, and that if we do not provide more jobs than ever before, we shall be in serious danger of a depression greater than any in the past.

Yet when one of the nation's large industrial concerns, with an admittedly splendid war production record, prepared to acquaint its distribution organization with a postwar program designed to produce more goods and to provide more jobs, the plans were hastily canceled at the request of the Army and the Navy. The reason offered was that the purpose of the meeting "might be misunderstood and taken to mean that the needs of war production are declining."

In war we are united and we accept a high degree of restriction on normal buying and selling practices so that we can insure full production of the things the Army and Navy need. But the problems of peace are likely to be more numerous than the problems of war, because we shall then have, not a common objective and one enormous consumer for our production, but millions of customers and millions of individual objectives.

No one will raise a voice against the pleas of military leaders for victory before reconversion. Any postwar plan worthy of the name must place winning the war at the top of the list of things to be done. But it seems to me it is not too early to be planning, and to be making known whatever plans we make, on that basis.

W.C.



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THE TREND

MANAGEMENT IN A LABOR CONFERENCE

Shortly before Pearl Harbor, President Roosevelt convened in the White House a conference of the top leaders of industry and labor to agree on a policy of settling wartime labor disputes.

That conference ended in some confusion as to the degree of actual agreement reached but with the announcement of a three-point national war labor policy—no strikes or lockouts for the duration, all disputes to be settled by peaceful means, a new top board of industry, labor, and public members to put government at the end of the settlement process.

• **Now comes a suggestion** that a new conference may be needed to hammer out a labor policy for the reconversion period that starts with the end of the war in Europe and, perhaps, to take soundings on our peacetime course in labor relations.

There is talk in Washington that developments may force the President's hand on this, and that, without waiting, he should take the lead and set up the framework for a conference in such a way that a sound agreement will be possible.

Behind some of this talk lies concern about the present efficacy of the National War Labor Board. Its prestige has been shaken at several points, going back to the time when Interior Secretary Harold L. Ickes dealt with John L. Lewis while the coal miners were still out, though the board had refused to consider any case during a strike.

Seizure of Montgomery Ward & Co., growing out of the mail-order company's fight against NWLB's authority to issue maintenance-of-membership orders, raised such a political uproar that the board has since been substantially unable to make "maintenance" stick against an employer's refusal, particularly where the government has not been a contractor for that employer's products.

Against further assertion of the policy that all disputes affect the war effort and must, therefore, be settled by NWLB, stands the successful defiance of James C. Petrillo and his American Federation of Musicians, for which the government showed itself wholly unarmed.

• **And, recently, in the midst** of the unions' attack on NWLB's job of holding the wage line, the board's A.F.L. members were temporarily withdrawn from its deliberations for one reason, C.I.O. threatened to pull its representatives out for another, and the whole wage row has become political dynamite in the agency's hands.

There may be a large lack of sympathy for NWLB's plight in some management quarters, but that plight is associated with something bigger. If the board is shorn of all effectiveness in making the no-strike pledge stick and of its control over disputes in nonwar industry, what happens when V-E Day both loosens the no-strike pledge and starts a shift of industry out of the war production area?

• **Is industry willing** to take its chance at that critical period when plants turn from munitions to civilian goods with labor change-overs that are bound to threaten strikes that can seriously impair reconversion? And, if willing, does industry consider it realistic to believe that, as strikes in reconverting plants incite trouble in those remaining on war production, the government—and public opinion—will then remain quiescent while men are still dying in the Pacific? Or that, if public opinion turned sharply against the unions in this event, and they were further weakened by a shrinkage in jobs, all this would be worth the price of the immediate disruption of industry's re-entry into the eager civilian market?

These are questions that must be considered in connection with the talk that a new management-labor conference could profitably get a reaffirmation of the no-strike pledge for the duration of the whole war and get it clear that this covered reconversion work as well as war work; that it could make NWLB a better instrument for keeping the labor peace for our remaining days of fighting; that it could exert some influence on the coming wage decisions and perhaps get some agreement on the maintenance of equitable wage and price controls until the danger of inflation is passed; that it could promote the settlement of more disputes at the plant bargaining table, instead of before NWLB; and that it could reinforce the effort to keep war workers on their jobs while our Pacific warriors remain on theirs.

• **There are, of course, those** who think that such a conference should go on to the construction of national machinery for the settlement of peacetime labor disputes, and, perhaps, to the job of tying it up with a national wage policy relating pay raises to gains in productive efficiency and with a definition of the terms on which strikes shall be permissible. They argue that American management and labor have matured to the point of making possible a peacetime agreement, not on NWLB's wartime compulsory arbitration system, but on dispute-settling machinery along the moderate lines of the Railway Labor Act.

Management, with some well-grounded fears of being pitted against a government-labor alliance, will go slow on such long-range proposals. But no company can afford to go slow in its thinking about labor policy for the transition. A conference on that subject would require the best that industry had to offer.

The Editors of Business Week